AF/3744

TRANSMITTAL OF APPEAL BRIEF (Small Entity)	Docket No. 2799CIP

In Re Application Of: **Timothy A. Barton**

Serial No.	Filing Date	Examiner	Group Art Unit
09/557822	April 25, 2000	Marc Norman	3744

Invention: **SYSTEM AND METHOD OF MARKETING COMPUTER NETWORKS**

TO THE ASSISTANT COMMISSIONER FOR PATENTS:

Transmitted herewith in triplicate is the Appeal Brief in this application, with respect to the Notice of Appeal filed on:

Applicant is a small entity under 37 CFR 1.9 and 1.27.

A verified statement of small entity status under 37 CFR 1.27:

☐ is enclosed.

☒ has already been filed in this application.

The fee for filing this Appeal Brief is: **$150.00**

☐ A check in the amount of the fee is enclosed.

☒ The Commissioner has already been authorized to charge fees in this application to a Deposit Account. A duplicate copy of this sheet is enclosed.

☒ The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment to Deposit Account No. **14-1131**
A duplicate copy of this sheet is enclosed.

Dated: **April 28, 2003**

Signature

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I certify that this document and fee is being deposited on April 28, 2003 with the U.S. Postal Service as first class mail under 37 C.F.R. 1.8 and is addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231.

Signature of Person Mailing Correspondence

Hannah Martin

Typed or Printed Name of Person Mailing Correspondence

cc:

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN THE APPLICATION OF:	)	
	)	
TIMOTHY A. BARTON	)	Group Art Unit 3744
	)	
SERIAL NO.: 09/557,822	)	
	)	Examiner: M. Norman
FILED: April 25, 2000	)	
	)	
FOR: SYSTEM AND METHOD FOR MARKETING OVER COMPUTER NETWORK	)	

APPEAL BRIEF

Honorable Commissioner of
Patents and Trademarks
Washington, D.C. 20231

Dear Sir:

Appellant submits this Appeal Brief under 37 C.F.R. § 1.192(a).

REAL PARTY IN INTEREST

As presently advised, the real party in interest is Freightquote LLC.

RELATED APPEALS AND INTERFERENCES

As presently advised, there are no related matters.

STATUS OF CLAIMS

Pending Claims 1 - 3 and 6 stand finally rejected under 35 U.S.C. § 103 and are the subject of this Appeal.

STATUS OF AMENDMENTS

No amendments after the Final Office Action have been filed.

SUMMARY OF INVENTION

The invention embodied in pending claims concerns a system for reducing errors in ordering freight services. (Ex. A; Specification at p. 21, lns 8-17). Often times when a user orders freight services, a wide variety of accessorial services may be ordered at extra cost. (Exhibit A; Specification at p. 21, lns 1-7). Such accessorial services may include, but are not limited to, arrival notification, construction site delivery, inside delivery, liftgate service, residential delivery, residential pickup, and Saturday pickup. (Ex. A; Figure 7).

Given the many different options available, it is not surprising that errors arise in the proper selection of the accessorial service or in the billing of the service. In fact, errors are so commonplace that there is an entire service industry devoted to auditing these types of errors. (E A; Specification at p. 21, lns 1-7).

To reduce customer related input errors from occurring, the present invention claims a system that requires a the user to sequentially address the accessorial services offered and to accept or decline each service offered. (Claim 1). By requiring the user to address the accessorial offered, Applicant has found that billing errors may be reduced. (Ex. A; Specification at p. 21, lns 15-17).

STATEMENT OF ISSUES

The issues for this appeal are:

1. Whether the claims are unpatentable as obvious in light of Laverly and Hunt, even though there is no motivation to combined the prior art to create the inventions set forth in the pending claims.

2. Whether the Examiner ignored limitations in claim 1 which require that the claimed invention is for a system to reduce user errors in ordering freight services and that the services are to be sequentially offerred to the user for either acceptance or to be declined.

3. Whether the Examiner's reliance on Laverly was in error since the reference is non-analagous prior art.

GROUPING OF CLAIMS

The independent claim at issue is claim 1. All pending claims will stand or fall with claim 1.

ARGUMENT

I. INTRODUCTION

Despite having already recognized the patentability of Applicant's invention (Ex. B, 3/13/03 Office Action, p. 5), the Examiner has now, in order to sustain a §103 rejection, stretched the teachings of the prior art to the point of distortion, ignored limitations found in the pending claims, and applied non-analogous prior art. Thus, as will be demonstrated below, the pending claims are indeed patentable.

A. There Is No Motivation To Combine The Hunt Reference With The Teachings Of Laverly

Long established precedent of the Federal Circuit holds that for a 35 U.S.C. § 103 obviousness rejection to be proper, the PTO must (1) established that the prior art would have suggested to one of skill in the art that they should make the claimed invention and (2) the prior art would have also revealed that there was a reasonable expectation of success in so making the combination. In re Vaeck, 947 F.2d 488, 493 20 USPQ2D 1438, 1442 (Fed. Cir. 1991). Here, as will be demonstrated below, the Examiner failed to cite any support for the conclusion that one of skill in the art would have been motivated to combine three distinct pieces of prior art to recreate the claimed invention.

Central to the Examiner's §103 rejection was a finding that the teachings of the Laverly reference (Ex. C) may be combined with U. S. Patent No. 5,835,716 to Hunt (Ex. D) and U. S. Patent No. 6,061,667 to Danford-Klein to arrive at the claimed invention (Ex. E). Yet, absent in the rejection is any support which establishes that a person of skill in the art would have been motivated to combine these three references. The reason for this

absence is that the divergent teachings of the prior art would dissuade a person from making such a combination.

For example, as reflected in claim 1, Applicant's invention concerns a system for reducing user related freight shipping errors. This is clearly reflected in the claim itself, which reads as follows with relevant parts in bold:

1. **A computer based system for reducing user errors in ordering freight services** comprising:

a) a server computer;

b) a distributed network connected to the server computer;

c) a user computer connected to the distributed network which can interact with the server computer;

d) a database on the server computer containing accessorial service information; and

e) **programs or software for sequentially displaying a plurality of accessorial services and requiring the user to address each of said accessorial services offered and to accept or decline said accessorial service s** wherein said services comprise two or more of the following: arrival notification, construction site, inside delivery, liftgate service, residential delivery, residential pickup, and Saturday pickup.

The prior art, on the other hand, has nothing to do with reducing shipping errors. The primary reference, Hunt, does not discuss how to reduce shipping errors. It is concerned with a method for brokering carrier capacity. (Ex. D; Abstract). Nowhere does Hunt discuss how shipping errors in ordering accessorial services may be reduced. In fact, the Hunt reference does not even discuss accessorial services anywhere within the specification. The only reference that discusses accessorial services is Danford-Klein (Ex. E). However, like Hunt, nowhere in this reference is there any indication that there is a

need to reduce errors in ordering these services or that errors even occur. Given that the prior art does not even recognize a need for Applicant's solution, it is not surprising that the references also fail to teach or suggest any remedy to reduce errors. In short, there is no suggestion, or teaching, or motivation to combine in this instance. The same is also true for the Laverly reference.

The Laverly reference, in contrast to Applicant's invention, uses an accept/decline function to impose a website's terms and conditions upon a user. Laverly says this may be done in a number of different ways. One way suggested is to make the terms and conditions conspicuous. (Ex. C at p. 1, paragraph 4). The other way is to require a user either accept or decline the terms by clicking on an appropriate button. (Ex. C at p. 1, paragraph 5). If the accept button is selected, access to the website is permitted.Id. On the other hand, if the terms and conditions are unacceptable, Laverly teaches that upon selecting the decline option, a user is denied access to the site and leaves the website:

> Require user agreement before proceeding. Common ways to get a user to agree to the terms of use include a button saying "I Agree" or a dialog box in which the user must type in his or her name. The user should also have the explicit **options to reject the terms and leave the Web site**, such a button saying, " I Do Not Agree."

(Ex. C)(emphasis added).

As with the other prior art references, Laverly makes no mention that the disclosed accept/decline technique may be used to reduce user related shipping errors. Nowhere in Laverly is it ever mentioned or suggested that its teaching may be used in other

applications or for other purposes. As Laverly states, it is directed at a solution to control the behavior of website users and to protect the intellectual property of the website owner:

> Without clear standards of behavior, users could start the chat room equivalent of a saloon fight, or make off like rustlers with a Web site's intellectual property.

(Ex. C).

Laverly's solution to control website activity clearly has nothing to do with reducing shipping errors. Recognizing that there is no support for a finding that one of skill in the art would be motivated to combine these diverse teachings, the Examiner simply filled in the blanks by declaring that the motivation exists. The problem, however, is that the Examiner did this without citing any specific support in any of the references cited:

> the notion of requiring a user to accept or decline is well known in the art of computer programming. Laverly, for example, teaches a system requiring user agreement before proceeding, and explicitly requiring the user to accept or decline the agreement (see page 1, 5th paragraph). The fact that the applicant applies this feature within the context of accessorial services does not render it patentable over the prior art . **It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply this accept/decline feature of Laverly to the system of Hunt et al. Since the basic concept (i.e., requiring a user to accept or decline an agreement before proceeding) is well known in the art**, and since applying this feature to the case of accessorial services is simply a specific application of requiring a user to accept or decline information. The accept/decline feature, even though applied by applicant to a different type of information, does not in itself render the claim patentable over the prior art.

(Ex. B; 3/13/02 Office Action at p. 4) (emphasis added).

Saying that the teachings of Laverly, Hunt, and Danford-Klein may all be combined to recreate the claimed invention without providing any support for such a conclusion

makes the rejection improper. For this reason alone the rejection should be reversed. There is more.

The prior art also teaches against combining the references. Applying the Laverly system to freight shipping would produce an unworkable result. This is so because Laverly teaches that in order to gain access to the site the terms and conditions must be accepted. Conversely, Laverly also teaches that if a user declines the terms, access to the website is denied (Ex. C). Applying this technique to shipping services would be disastrous. What would happen is that once an accessorial service is declined, the user must leave the site. The only way for a user to continue processing a shipping transaction within the site would be to accept all accessorial services offered. While this may result in more business for the shipper, it is a system which is impractical for obvious reasons. In other words, Laverly teaches away form the claimed invention, since, if its teaching as a whole are applied to shipping services, an unworkable system would result.

Nor may the complete and entire teachings of Laverly be ignored. By law, a reference must be considered as a whole for everything it teaches. It is impermissible under §103 to pick and choose from a reference only so much of it as will support the Examiner's position, to the exclusion of other parts necessary to a full understanding of what the reference fairly would have suggested to one of ordinary skill. Bausch & Lomb, Inc. v. Barnes-Hind, Inc., 796 F.2d 443, 448, 230 U.S.P.Q. 416, 419 (Fed. Cir. 1986); In re Hedge, 783 F. 2d 1038, 1041, 228 U.S.P.Q. 685. 687 (Fed. Cir. 1986).

In short, contrary to the conclusion reached in the Office Action, a person of skill in the art would not be motivated to combine the prior art to arrive at Applicant's claimed invention. The opposite is true. A person of skill would, in fact, be dissuade from combining the references since an unworkable system would result.

B. The Prior Art Fails to Teach the Claimed Invention

As set forth in claim 1, the present invention concerns a system for reducing user errors when ordering freight services. This is a specific limitation found in Claim 1 that was added by amendment at the request of the Examiner (Ex. C at p. 2). This error reduction limitation is simply not found in the prior art. The primary reference, Hunt, does not discuss how to reduce shipping errors. It is concerned with a method for brokering carrier capacity. (Ex. D; Abstract). The same is also true for the Laverly reference.

As plainly evident in Laverly, it has nothing to do with freight services. Nor does it have anything to do with reducing errors. It is an article written by an attorney specializing in intellectual property and on-line transactions that addresses the problem of how to impose legal terms on website users. (Ex. C). In fact, not a single reference has been cited in any Office Action that addresses how to reduce errors in freight ordering. This absence demonstrates that the prior art does not render Applicant's invention unpatentable.

Independent claim 1 also requires the use of "programs or software for sequentially displaying a plurality of accessorial services and requiring the user to address each of said

accessorial services offered and to accept or decline said accessorial services...." Again, the art of record also fails to teach this claim element.

As shown above, Laverly cannot teach this claim element since it has nothing to do with freight shipping. Laverly's focus is on getting users to agree to the terms and conditions of a website - - a one time task that must be completed prior to entering the site. (Ex. C). This stands in contrast to the claimed invention which requires that the accept/decline technique be applied repeatedly.

The same is true for Hunt. Hunt, while concerned with shipping services, is directed at a system for brokering excess carrier capacity (Ex. D). The only source for any teaching on how to reduce shipping errors is Applicant's patent application. In essence, what has been done here is that Applicant's own teachings have been read into the prior art.

As the Federal Circuit has held, that is legally wrong. Vandenberg v. Dairy Equipment Co., 740 F.2d 1560, 1564, 224 U.S.P.Q. 195, 197 (Fed. Cir. 1984). It is improper to use an inventor's patent application as an instruction book on how to reconstruct the prior art in hindsight:

> a prior patent must be considered in its entirety, i.e., as a whole, including portions that would lead away from the invention in suit, elements of separate prior patents cannot be combined when there is no suggestion of such combination anywhere in those patents, and a court should avoid hindsight.

Panduit Corp. v. Dennison Mfg. Co., 810 F.2d 1561, 1568, 1 U.S.P.Q.2d 1593, 1597 (Fed. Cir. 1987) (citations omitted). Yet, only by making use of the "tempting but forbidden"

process of hindsight (see Loctite Corp. v. Ultraseal Ltd., 781 F.2d 861, 873, 228 U.S.P.Q. 90, 99 (Fed. Cir. 1985)) can Applicant's invention be constructed from the teachings of Laverly and Hunt:

> To imbue one of ordinary skill in the art with knowledge of the invention in suit, when no prior art reference or references of record convey or suggest that knowledge, is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher.

W.L. Gore & Associates, Inc. v. Garlock, Inc., 721 F.2d 1540, 1553, 220 U.S.P.Q. 303, 312-13 (Fed. Cir. 1983).

In short, what has been done in this instance is that the teachings of Laverly have been stretched to the point of distortion and read into Applicant's own specification. Laverly clearly teaches that the legal terms of a website may be imposed on a website visitor by employing an accept/decline technique. This, however, is not a teaching that a system using an accept/decline technique may be used to reduce shipping errors. To say that it does simply distorts what the reference actually discloses. Based upon the above, the claims are indeed patentable over the prior art.

II. LAVERLY IS NON-ANALOGOUS ART SINCE IT IS DIRECTED AT IMPOSING LEGAL RESTRICTIONS UPON A USER OF A WEBSITE

Laverly is simply not analogous prior art. In order to cite a reference as prior art for purposes of showing obviousness, the Examiner must demonstrate that it is from the same field of endeavor or reasonably pertinent to the problem facing the inventor of the challenged patent. In re Clay, 966 F.2d 656, 658-59, 23 U.S.P.Q.2d 1058, 1060 (Fed. Cir. 1992). In Clay, the Federal Circuit held that a reference concerning the use of gel in

underground petroleum reservoirs was not prior art to a patent application directed to the use of gel in aboveground petroleum storage tanks, even though both activities related to the petroleum industry. 966 F.2d at 659-60, 23 U.S.P.Q.2d at 1060-61. See also, In re Deminski, 796 F.2d 436, 442, 230 U.S.P.Q. 313, 315 (Fed. Cir. 1986) (reference must be within the field of the inventor's endeavor or at least reasonably pertinent to the particular problem with which the inventor was involved); A.J. Deer Co. v. U.S. Slicing Mach. Co., 21 F.2d 812, 813 (7th Cir. 1927) (device for cutting logs not analogous to device for slicing meat).

Here, the connection between Laverly and Applicant's invention is even more tenuous than in the foregoing cases. As stated above, Laverly deals with how to get users to abide by the legal terms of a website and if acceptance is not gained, the user must exit the site. Nowhere does Laverly discuss freight shipping services or how to reduce errors in this field of endeavor. The two fields of endeavor simply could not be more different. At best, a person of skill would look to Laverly as a system that teaches how to impose legal or contractual terms on a user. A person of ordinary skill in the art seeking to reduce shipping errors, however, would not look to the teachings of Laverly as a solution. The Examiner's reliance on Laverly, therefore, is misplaced.

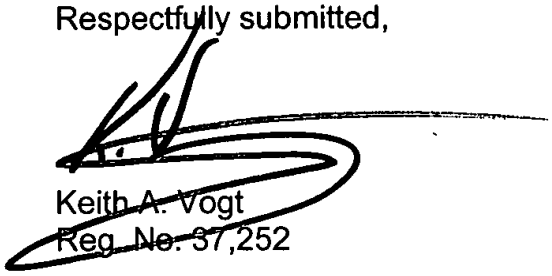
Nor is Laverly a pertinent prior art reference since it is directed at a different problem than that confronting Applicant. As Laverly expressly states, it is directed at creating a legal solution for website operators. Applicant's invention, as reflected in the claim language itself, is directed at reducing shipping errors associated with a user's

selection of accessorial services. Nothing in Laverly suggests that its teachings could be used to solve the problems confronting Applicant. As such, Laverly cannot be considered as prior art in this case. Thus, the rejection should be reversed.

III. CONCLUSION

For the reasons stated above, the claims should be found allowable once again.

Respectfully submitted,



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Dated: April 28, 2003

APPENDIX

1. A computer based system for reducing user errors in ordering freight services comprising:

a) a server computer;

b) a distributed network connected to the server computer;

c) a user computer connected to the distributed network which can interact with the server computer;

d) a database on the server computer containing accessorial service information; and

e) programs or software for sequentially displaying a plurality of accessorial services and requiring the user to address each of said accessorial services offered and to accept or decline said accessorial services wherein said services comprise two or more of the following: arrival notification, construction site, inside delivery, liftgate service, residential delivery, residential pickup, and Saturday pickup.

2. The system of claim 1 wherein each accessorial service must be addressed individually.

3. The system of claim 2 wherein each accessorial service must be addressed individually.

6. The system of claim 1 wherein the accessorial services are presented as a list.

Exhibit A

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

TITLE OF THE INVENTION:	SYSTEM AND METHOD FOR MARKETING OVER COMPUTER NETWORKS
DOCKET NO.:	2799CIP
INVENTORS:	Timothy A. Barton
ATTORNEYS:	Keith A. Vogt 181 West Madison Suite 4600 Chicago, Illinois 60602 (312) 236-0733

Field of the Invention

The invention claimed relates to computer networks, and particularly, to marketing over computer networks and to network marketing and provision of freight trucking services.

Background of the Invention

Historically, less-than-truckload ("LTL") freight trucking services have been rated and scheduled by phone calls to individual carriers or brokers, and confirmatory faxes or letters. As a result, the time involved in obtaining competitive quotes, scheduling the shipments, billing, tracking and confirming shipments has been significant. In addition, invoices, bills of lading and other important documentation have often contained mistakes or errors, leading to further time spent rectifying any problems. Because of the often personal nature of the quotes provided, it has been difficult to obtain accurate quoting services and rapid scheduling, and impossible to obtain a choice of freight trucking services from a single-source real-time network-based solution. In addition, significant errors in billing often occur with respect to accessorial services which include, among others, arrival notification, inside delivery and liftgate services. Often, a customer fails to notify the shipping agent that such services are desired or the shipping agent inputs the incorrect information while taking the order. These types of errors are so pervasive in the shipping industry that entire service companies exist to audit shipping invoices to correct these types of errors. Another error that is common is to enter an incorrect zip code for the delivery location. This again leads to both delivery problems and to billing inaccuracies similar to those described above.

Freight trucking services ordinarily consist of: rating, scheduling, tracking, confirming, and billing. Other related services can also be provided. It is useful to be able to see or generate reports of shipments made or in progress.

Rating the shipment involves providing information to the carrier or broker regarding the origin, destination, and kind of shipping desired. The carrier or broker then determines the rate, often with a negotiated discount, and quotes the rate to the user. The user will then schedule the shipment's pickup and delivery, if the rate is acceptable. It is useful for the user to be able to track the shipment, which is to be able to ascertain the transit status of the shipment once the order has been placed. Tracking services provided to the user are commonly based on a shipment number, which the user must have or look up if the user wishes to track a package. These tracking services allow the user to track single packages, based on the tracking number alone.

If a broker is used, the broker will need to confirm the shipment with the carrier in order to verify that the carrier will have capacity to handle the shipment. Again, this process typically involves telephone calls, faxes, and person-to-person contacts. These contacts lend inefficiency, inaccuracy, and time to an already cumbersome system, but are typically the way freight trucking shipments are rated and scheduled currently.

In freight trucking, volume discounts are often given by carriers in order to induce users to ship with them, and reward repeat business. These discounts can amount to up to 70% of the carrier's base tariffs, and often result in substantial savings to those shippers able to get such discounts. These discounts are not typically available to individual users, other than based on their individual volume of shipments. Sometimes, these volume discounts may be granted to a broker,

who may pass a portion of the discount on to the broker's users, or to a group of similarly situated shippers.

A number of network-based shipping services have come into being in recent years. These services, typically, perform the same services provided by a carrier, but over the Internet or other network. Typically, the services provided will be a simple quoting or rating service, along with a scheduling request. No services provide real-time rating and scheduling of shipments or customized branding and reporting by user.

While a number of specialized network-based services have been developed for target markets such as network-based auctioning, retail sales, or grocery shopping, no advanced system for providing general freight shipping services over a network has been developed.

Additionally, existing network-based services generally have a model which is used for providing services. Such a service will be provided with either a single affiliation or a banner advertisement which will be determined randomly at the time a user accesses the service. Hence, a web site or other network-based service will have advertisements or affiliations, but these affiliations and advertisements will be statically determined or based on random selection. In other words, a single web-site or network-based service will appear to be affiliated with only one group or organization, and though it may have a plurality of advertisers, those advertisers may appear as a group or in banner advertisements.

Definition of the Terms

The following terms are used in the claims of the patent as filed and are intended to have their broadest equivalent meaning consistent with the requirements of law.

"Affiliation" or "Association" means an organization or group of which a user may be a member.

"Affinity group" or "affiliation group" means a group with similar interests, such as a professional organization or other group. Any group of users may be referred to as an affinity group or affiliation group.

"Branding" means marking or displaying an affinity or affiliation indication or associating a service with an affinity or affiliation.

"Carrier SCAC" or "SCAC" means or any code or abbreviation used to represent a carrier.

"Carrier information" means any data or information stored in the database regarding the carriers. This may include SCAC, rate information, discount information, markup information, or any other kind of information related to a carrier.

"Customer information or user information" means any data or information stored in the database regarding the customer.

"Customer" means a user who has been registered with the service, and has access to a master account or a sub-account.

"Database" means a collection of information stored in a format which allows searching by a computer, program or user.

"Freight trucking" means land-based shipping of full or partial loads by any shipping vehicle, such as a truck, automobile, panel van, or other shipping vehicle.

"Freight trucking" means shipping performed over land, using trucks, either the entire truck or a portion thereof.

"Freight marketing" means the marketing of freight trucking services.

"HTML" means Hypertext Markup Language.

"LTL shipping" means "less-than-truckload" shipping, or shipping involving any size load, including specifically loads with are less than an entire truckload. This definition is meant to be inclusive rather than exclusive, and also includes loads which are equal to or greater than an entire truckload.

"Marketing" means advertising, selling, providing, or any combination thereof.

"Master Account" means an account on the Service affiliated with a single user. An account will usually include a personal identification, such as a name or code, and a password or PIN. This account will grant access to the Service upon the entry of the personal identification and the password or PIN, though it may involve any kind of mechanism for identification of the user, such as a password or account name alone, or a name paired with a "cookie" provided by the user's computer, or any similar device.

"Network" means any distributed computer network, including, without limitation, both private and public networks, such as IPX networks or the Internet.

"NMFC number" means National Motor Freight Classification number, but may also indicate any code in any system for classifying freight shipments.

"OCR" means optical character recognition.

"PIN" means personal identification number.

"POD" means proof of delivery or proof of delivery form.

"Programs" or "software" means any machine-operable code stored on a computer permitting it to operate or perform a function.

"Quotation" means a price quote for a service, such as a shipment.

"Rating" means quoting a price based on shipment data provided by a customer or user, such as a stated shipment type, origin, and destination.

"Shipper" means the location, entity, user, or person from which a shipment is picked up or sent.

"Sub-account" means a sub-division of a master account. These sub-accounts may be accessible by the Master Account's user through use of a separate password or PIN.

"The service" means the service for providing services related to freight trucking over a distributed network such as the Internet or World Wide Web, or any other distributed network.

"The system" means the computer hardware and software used in providing the service. In the currently preferred embodiment, this includes the server computer.

"The server" means the computer hardware used in providing the service. This may include, as in the currently preferred embodiment, a web server and a database server. The server may also be a single computer or a plurality of computers.

"Carrier" means an individual or organization providing freight shipping services.

"Tracking" means providing information regarding shipment status.

"User" means customer, potential customer, or other person accessing the service.

"Web browser" means any software adapted for accessing web pages or other files over the Internet or a distributed network. Examples of such software are Netscape Navigator and Internet

Explorer. Where alternative meanings are possible, the broadest meaning is intended. All words used in the claims are intended to be used in the normal, customary usage of grammar and the English language.

Summary of the Invention

The invention provides a novel system and method for affiliation of a service provided over a network with a plurality of entities and a novel system and method for providing customized shipping quoting, scheduling, tracking and reporting.

A novel feature of the invention is the custom branding of the services provided with an association, affinity group, or organization logo and name, ascertained from information provided by the user. Any service provided may appear to different customers or users to be provided by or affiliated with different associations, organizations or affinity groups. This feature is novel with respect to all services provided over a distributed network.

The invention allows a user to obtain actual quotes for LTL shipping from a plurality of carriers. The user may then schedule the pick-up and shipment from the shipper of choice, and generate a bill of lading and customer invoice. The user benefits from group or other discounts provided by the service or their affiliation, and may choose the most favorable rate from among a number of shippers, or may choose a favored shipper based on criteria of the user's choice. The user is able to obtain an actual rate, incorporating any discounts, and can see precisely the amount which the user will pay if the user elects to use the shipping service quoted.

The invention maintains a database of carriers, and upon receiving a rating request from a user, queries the database in order to determine which carriers will provide service. The system then

determines the rate applicable to each carrier, based on any volume discounts provided and applicable markups, and quotes the rates of all applicable carriers to the user. Once the rating process is completed, the user may choose the carrier it wishes to use for the shipment, and schedule the shipment.

The invention permits the user to select from a plurality of features or accessorial services for the shipping services chosen, such as arrival notification, inside delivery, liftgate services, or others. The charges for these features or accessorial services are automatically calculated and displayed to the user. Moreover, inaccuracies with respect to the accessorial service charges are further reduced by requiring the user to address each accessorial service individually before the user may exit the accessorial page and move further through the system.

The invention permits the user to rate and schedule either a single shipment or a plurality of freight shipments at one time.

Yet another aspect of the present invention is to reduce errors resulting from inputting incorrect zip code information. This may be accomplished by comparing the inputted delivery location zip codes with stored delivery location zip coded used by the shipper in the past to determine, if the zip code information inputted reconciles with locations used in the past.

Another feature of the invention is the ability to customize the interface for each customer or user, permitting the quoting service to recall for the customer or user their prior orders, and data provided earlier by the user. The system dynamically stores shipping addresses and other data for each user, permitting the user to schedule later shipments to or from repeated addresses, bill repeat customers, or perform any repetitive task without requiring the user to supply information again.

This feature is novel in the area of freight services marketing over a distributed network, and has numerous novel aspects.

An aspect of the customization is the ability to generate specific management reports, specifically permitting the user to create and run customized reports, which can then be transmitted to the user either over the network, via electronic mail or facsimile. These reports can cover shipment tracking, shipment usage, or other features of the service, can be run both by user request and automatically, and can cover shipments already invoiced and not yet invoiced.

Another aspect of the customization is the ability for each user to maintain sub-accounts for each master account. A user may have multiple sub-accounts for each master account, with each sub-account having its own password or PIN. These accounts may be associated with different employees of the user, different customers of the user, or any categorization which the user desires. This permits the user to restrict access to certain information or to more easily track different uses of the service.

Another aspect of the customization permits the user, once the user has scheduled shipments, to access a tracking report or shipment log of all prior shipments. These shipments may be tracked by the user without reference to a specific shipment number or code, and permits the user to access, both by user and by sub-account, records of all shipments scheduled through the service. Individual shipments may also be tracked without the use of a tracking number or code.

Another aspect of the customization permits a user to access invoices, past and present, including payments and credits. The user may also view payment and credit details on a monthly basis. Another aspect of the service permits the user to maintain and utilize a database of NMFC

numbers for the products shipped, allowing the user to accurately rate and schedule shipments based on both standard product descriptions and their own customized product descriptions, with appropriate NMFC numbers provided automatically by the system.

Another aspect of the service permits the user to create and print invoices for the user's own customers. These invoices may be printed while the user is accessing the service upon scheduling a shipment. The service stores customer information for each user, which the user may access for repeat shipments. The invoices are custom-generated for the user, and the system permits the user to add their cost to the cost of the freight, thereby permitting a completely custom invoice. The invoices are printed on a ready-to-mail form for the convenience of the user.

Another aspect of the invention is automated pickup confirmation. The system either electronically notifies or faxes the carrier chosen by the user with an automatically generated pickup confirmation request. The fax request contains check-boxes for the carrier to mark, indicating whether the carrier will be able to handle the shipment or not. The carrier then faxes the request back to the service. The service automatically recognizes the pickup confirmation request using OCR software and updates the system automatically to reflect the carrier's reply. The user may access the system at any time to determine whether or not the user's shipment has been accepted, and track the shipment's status.

The system will also permit the user to print a Bill of Lading. In addition, if the user is not the shipper, the system can automatically fax a Bill of Lading and pickup instructions to the shipper.

The entire process of rating and scheduling a shipment may be performed by the user via access to the system. No telephone calls need be made, no confirmatory faxes or letters are sent by

the user. The user can rate, schedule, bill and track an entire shipment through access to the system, and generate custom reports regarding the user or any sub-accounts regarding the use of the system. Thus, the invention is a single-source, network-based solution for marketing freight trucking services.

Brief Description of the Drawings

Figure **1** shows an overview of the system, including the user computer, a network, and the service's server computers.

Figure **2** shows an overall flowchart of the service, from a user's point of view.

Figure **3** shows the login page for a web-based version of the invention.

Figure **4** shows the main menu page for a web-based version of the invention.

Figure **5** shows the rating page for a web-based version of the invention. Figure **5A** shows an example of a multiple class entry page.

Figures **6** and **6A** show the address information page for a web-based version of the invention.

Figure **7** shows the accessorial services page for a web-based version of the invention.

Figure **8** shows the product description page for a web-based version of the invention.

Figure **8A** shows a shipment ready page for a web-based version of the invention.

Figure **9** shows the third-party invoice page for a web-based version of the invention.

Figure **10** shows a specimen invoice.

Figure **11** shows the complete shipment page for a web-based version of the invention.

Figure **12** shows a sample Bill of Lading.

Figure **13** shows the invoice inquiry page for a web-based version of the invention.

Figure **14** shows the shipment tracking page for a web-based version of the invention.

Figure **15** shows the customized reports page for a web-based version of the invention.

Figure **15A** shows a run cost report page for a web-based version of the invention.

Figure **15B** shows a sample cost report.

Figure **15C** shows a run tracking report page for a web-based version of the invention.

Figure **15D** shows a sample tracking report.

Figure **16** shows the manage sub-accounts page for a web-based version of the invention.

Figure **17** shows the LTL rating process.

Detailed Description of the Preferred Embodiments

Set forth below is a description of what is currently believed to be the preferred embodiment or best example of the invention claimed. Future and present alternatives and modifications to this preferred embodiment are contemplated. Any alternatives or modifications which make insubstantial changes in function, in purpose, in structure or in result are intended to be covered by the claims of the patent.

The invention's preferred embodiment currently is a web site, and may best be understood in terms of use over the Internet. It can readily be seen, however, that the essential design of the system and the services provided by it do not require the use of a web site over the Internet, but may be implemented through the use of any server over any network, including the Internet, an IPX network, or any distributed network of computers with access to a server or computer on which the system operates. The system providing the services of the invention may comprise a number of

computers, such as a web server and a database server, or a single computer performing all of the functions of the invention, so long as the user may access the functions over a network.

The present preferred embodiment of the system is the preferred embodiment given the present technology available and the kinds of networks currently in popular use, and is not meant to restrict the specification or practice of the invention in any way by reference to a specific kind of network, server, computer, or operating system. Equivalent computers, networks, or operating systems are expressly contemplated by the invention, and could be used to practice the invention.

In Figure **1**, the overview of the system is shown. The system server, including web server **1** and database server **2**, permits users to access the services over the Internet **3** from any user computer **4** connected to the Internet. This connection may be via modem, DSL, Ethernet or any other connection. The user connects to web server **1** using the web browser of their choice. Examples of such browser programs are Netscape Navigator or Microsoft's Internet Explorer. It can readily be seen that access may also be by dedicated connection or direct dial-in, or any web browser software could be used to access the server in an alternate embodiment. In the present embodiment, it is preferred to use Internet Explorer or Netscape Navigator, which are the two most popular browsers in common use at the present time. Web server **1** is itself connected to database server **2**, which performs the storage, query, and lookup functions of the invention. It can readily be seen that a single, more powerful computer could perform the functions of both web server **1** and database server **2**, or that more than two computers may be used to perform the functions of the service. Any of user computer **4**, web server **1**, or database server **2** may also be protected by a firewall or other device without affecting the invention, so long as the system server is accessible by the user

computer. The database may be kept and required lookup functions performed via a variety of common web and database server programming methods. Individual lookup or searches of the database are not described in this description, as they are easily within the scope of one of ordinary skill in the art. The currently preferred embodiment of the invention uses Oracle 8.0 database software and Microsoft's Internet Information Server web server, but any similar server and database software may be used, and custom written software may be used in order to practice the invention. The use of any specific software or lookup table is not meant to limit the scope of the invention, but only as an example of the currently preferred embodiment. It is worth mention that the use of a web server and a database server or their equivalents are well known in the art, and where the specification calls for the database server, the web server, or the system, to perform a function without further description, the actual operation or programming of the system to perform the action or function described is well known in the art, and will be readily apparent to one skilled in the art. In the currently preferred embodiment, the servers used are as described, and the web pages themselves are programmed in HTML. Oracle is used to maintain the database of information, which permits the service's operators or administrators to alter the customer information, carrier information, rate information and other information stored within the database.

Figure **2**, shows a flowchart of a possible presentation of the system to the user, in the currently preferred embodiment. The user enters the service by accessing a login page **5** via the user's web browser. On that page, one possible example of which is shown in Figure **3**, the user enters the user's access code **23** and PIN **24**. If the user is a prospective customer or has no access code, the user is given a promotional tour of the features of the service. If the user is an existing

customer, the user is redirected to the user main menu page. Figure **3** shows one example of a possible login page.

If the user is a customer, the customer will be redirected to the customer main menu **7** instead of the tour. Once on the customer main menu page, which is shown on Figure **4**, the user is permitted to follow links in order to rate and schedule shipments **8**, view shipment logs **9**, view management reports **10**, or review invoices **11**. Links for each choice are provided on the main menu page. If the PIN **24** entered by the user on the login page indicates that a sub-account is to be used, access will be granted only to the sub-account's information.

As seen in Figure **4**, every page which a user may visit may be custom branded with a special logo in the affinity indication portion **24** of the page. This logo will be based on the user's affiliation. For example, if the user is a member of the ABC Association, which the service determines based on the user's master account, the ABC Association's logo or title will be placed in the affinity indication portion **6** of each page during all access. This is true even of the tour, if the tour is the result of access based on a promotional flyer with a user code. The user enters the code, which begins the tour. The tour will be affinity branded based on the code entered. This permits affinity groups to market specifically to their members, with every aspect of the web site branded to their group.

If the user chooses to rate and schedule shipments, the user will be led through a series of pages for rating, scheduling, invoicing, and confirming the shipment. First, the user will be directed to the rate page **8**, where the user may rate a shipment or a plurality of shipments. The user will then

be allowed to schedule any of the shipments, and will be led through the scheduling process for each shipment.

For each shipment, the user will be led through the following process, and may either confirm and send or cancel each shipment:

The user will be directed to the Schedule 1 page **12**, where the user may enter new shipping information or recall old shipping information in order to schedule the shipment or shipments. If the user enters new information, the system will store the new shipping information for future recall during the Schedule 2 **13** phase, as the user is directed to the additional services page at Schedule 3 **13**, where the user may choose accessorial services for each shipment. After choosing accessorial services, the user will be directed to choose a product description for the shipment on the product description page in the Schedule 5 phase **15**. The user may add or re-use product description, and the service will save any new product designations for future use. The user then schedules the pickup, on a scheduling page in the Schedule 6 phase **16**. The user may create an invoice to bill the user's customer in the Schedule 6 phase **17**, which the user may print out directly from the browser during the Print Invoice phase **18**. If the user confirms the shipment on the confirm shipment page **19**, the user prints a Bill off Lading (Print BOL **20**), the system faxes a Bill of Lading to the shipper if the shipper is different from the user, and the user may begin scheduling the next rated shipment, if any.

If the user has completed scheduling or canceling all rated shipments, the user is returned to the Customer Main Menu **7**.

I now describe the individual pages of the system, commencing with the scheduling pages. These pages are described in the same order they were discussed, and appear in Figure **2**.

Figure **5** shows a web page designed for rating a single shipment or a plurality of shipments. For each shipment the user wishes to have rated, the user may enter the origin zip into an origin zip entry box **30**, the destination zip into a destination zip entry box **31**, select a class from a class drop down box **32**, and enter the total weight in a total weight entry box **33**. If the user chooses 'multiple' from drop down box **32**, the user will be redirected to the multiple shipment information page (Fig. **5A**). Once the user has entered the multiple class information for the shipment, the user will be returned to the rating page shown at Figure **5**, which will now show the 'multiple' class for the shipment, and the total of the weight information entered in the multiple shipment information page. Upon entering all of the information and pressing the rate button **34**, the system will rate the shipment according to the rating system described below (and shown in Fig. **17**), and report the carrier in the carrier column **36** and that carrier's rate in the price column **35**, along with the estimated time of transit in the estimated transit column **37**. When the user has rated all the shipments desired, up to a maximum of ten in this embodiment, the user may choose which, if any of the shipments, to schedule. The user clicks 'yes' or 'no' in the radio buttons **39** in the arrange pickup column **38.** Upon clicking the next button **40**, the scheduling process will begin.

For each shipment, the user will follow the scheduling process, as described above, and shown in Figure **2**. The first page shown to the user is the address information page, shown in Figure **6**. This page permits the user to enter new addresses or access existing addresses in any convenient format. First the user will choose whether the user is the shipper, receiver, or a third party for the

shipment, using radio button **41A**. At Figure **6A**, the page is shown for the user as shipper. The user will enter or recall address information for the shipper and the recipient of the shipment. In the current preferred embodiment, existing addresses may be accessed through a drop down box associated with company name entry boxes **43** and **44**. These entry boxes permit the user to type in a new name, or, if existing companies are stored in the database server **2**, to access existing addresses by using the drop down box. If the drop down box is used, the remainder of the information in either shipping address box **41** or receiving address box **42** will be entered automatically by the web server **1** and database server **2**. Any format may be used for address information. The currently preferred embodiment suggests a format of Company, Street Address 1 and 2, City, State, Zip, Phone, Fax, Contact Name and Shipper Reference. The database of address information stored in the database server **2** stores the information by user and sub-account, if used, and permits the system to provide address storage to each user and sub-account.

As an additional verification step to reduce shipping errors, the receiving address data such as the zip code is compared against stored data for reconciliation. If the newly inputted information matches previously inputted information, no action is taken by the system. On the other hand, if an inconsistency is detected, such as an incorrect street number or zip code, the user will be prompted to verify that the correct information has been supplied. This may be done by simply having the user re-input the information or displaying the previously entered information so that a comparison may be made. Of course, the system may also prompt the user to select between the stored data and the new user input to make any needed reconciliation. Moreover, the system may also be programed to

allow the user to further edit the information stored by either editing the stored data or using the new user input as further new user input.

The shipment information box **45** permits the user to see information sufficient to indicate which shipment is currently being scheduled. In the currently preferred embodiment, the information presented is the carrier and carrier SCAC, origin and destination zip codes, weight, class, cost, fees, and estimated time of transit. It may readily be seen that the information presented need only be sufficient to identify the shipment, and need not necessarily be the same as that shown in the currently preferred embodiment. If the user is the shipper or the recipient, the user's information will automatically be shown in boxes **41** or **42**, as appropriate. If the user is a third party, the user's address information may be shown in a third box, and the user will choose or enter address information for both boxes **41** and **42**. The next button **46** allows the user to proceed to the accessorial services page and the back button **47** allows the user to return to the rating page.

The accessorial services page is shown as Figure 7. The same information is shown in the shipment information box **45**. The check boxes **50** each correspond to an accessorial service. It can readily be seen that the accessorial services **51** may be any set of accessorial services commonly offered by carriers. Upon the user checking one of the check boxes **50**, the corresponding additional charge **52** will be shown next to the corresponding accessorial service description **51** and, in the currently preferred embodiment, added to the Additional Fees section of shipment information box **45**. The charges are determined by the service's database server **2**, and displayed by the web server **1**. Thus, it is readily seen that the user, at all times, can see the exact price currently offered by the service for the shipment.

It is in this area of accessorial service charges that frequent billing errors occur. Billing errors of this type are so prevalent in the shipping industry, as a result of customer error or error by the shipper in properly inputting the data on the order, that an entire service industry to audit these types of errors has been created. These types of companies compare the invoices to the actual shipping data to determine if over-charges had been made. For example, charging for an accessorial service not provided or ordered. It is estimated that the these types of errors are in the hundreds of millions, if not more, given the size of this industry.

To reduce customer related input errors from occurring, the system may be programmed to require the user to address each accessorial service 51 listed. In operation, each check 50 is sequentially addressed with the user being required to indicate whether or not each accessorial service is required. Once each check box 50 is addressed, the user may then click the next button 48 to proceed to the product description page, or the back page button 49 to return to the address information page. Because of the importance of obtaining accuracy with respect to the accessorial services, the system may be programmed to prevent the user from moving further back or forward through the system until each accessorial service is addressed. In summary, it has been found that billing errors associated with accessorial services may be reduced by requiring a user to accept or decline each service before permitting the transaction to be completed.

In addition, a further benefit may be provided to the user in the form of a list or summary of accessorial services selected and services rejected. This is yet another verification step that has been found to reduce errors. As a further requirement, the system may also be programed to prevent the transaction from being completed until at least one element of the accessorial service list has been

selected by the user, or that no service has been affirmatively selected by the user. Lastly, the system may also be programed to prevent a transaction from being completed until all listed accessorial services have been addressed by the user.

The product description page is shown at Figure **8**. This page allows the user to enter product descriptions for each class of product in the shipment. A product description drop down box **55** permits the user to use already available descriptions, or to store new descriptions in the database. If the user wishes to use a pre-existing description, the user simply chooses it using the product description drop down box **55**. If the user wants to add a new description, the user simply chooses 'Add a Product' or a similar designation from product description drop down box **55**, and types in the new description. The user will then choose an NMFC number to associate with the product, and enter the NMFC number in NMFC number box **58**. If the user uses a pre-existing product description, the service will automatically use the NMFC number associated with that description in the database. Class and weight are shown in class display column **56** and weight display column **57**. Class and weight are both shown for each portion of the shipment based on the information from the shipment rating page. The user may also check a hazardous materials check box 59 for any portion of the shipment. The price of the shipment will be automatically recalculated by the service and displayed in shipment information box **45**. The user will also indicate, from a package type drop down menu **60** the type of package used with each portion of the shipment, and in a number of packages entry box **61** the number of packages of each type. Once all of these decisions have been made for each portion of the shipment, the user may click on next button **53** to proceed to the shipment ready page. The user may also click, at any time, on back button **54** to the accessorial

services page. The shipment ready page (Fig. **8A**) simply permits the user to indicate, via drop down boxes **54B**, **54C**, and **54D**, the time the shipment will be ready for pickup. Any equivalent method could be used. Next button **53A** allows the user to proceed to the third-party invoice page, while back button **54A** returns the user to the product description page.

The third-party invoice page is shown at Figure **9**. This page allows the user to prepare an invoice for a third-party for each shipment scheduled, if desired. If the user wishes to print a third-party invoice, he may do so using invoice radio button **62**. Using discount radio button **63** the user determined whether or not to pass on the discounts received from the service to the customer. In third-party address box **64**, the customer chooses or enters address information for the third-party to receive the invoice, in the same manner as shown above. As above, the service permits the user to recall old third-party information by accessing the database server **2** via a drop down menu or enter new address information. Once the user has completed any necessary entries on this page, the user may click on next button **66** to proceed. The user may also click, at any time, on back button **67** to return to the shipment ready page.

If the user has chosen to print a third party invoice, upon clicking next button **66**, the user will be presented with a specimen invoice, which the user may then print. Such a specimen invoice is shown at Figure **10**. The user may click on print button **68** to print the invoice, then next button **69** to proceed to the complete shipment page. The user may also click on back button **70** to return to the third-party invoice page.

The complete shipment page is shown at Figure **11**. This page presents the user with a final opportunity to cancel the shipment. If the user clicks on cancel movement button **71**, the user will

cancel the shipment and proceed to scheduling the next shipment or return to the main menu if there are no further shipments to schedule. If the user clicks on ok button **72**, the shipment will be ordered, and the user will be presented with a Bill of Lading to review. A sample Bill of Lading page is shown at Figure **12**. Any reasonable bill of lading format could be used. In this example, when the user clicks on print button **73**, a bill of lading will be printed on the user's printer. The user may print as many copies of the BOL as needed, and then click on the next button **74** in order to proceed. If the user has rated shipments remaining to schedule, the user will be returned to the address information page to schedule the next shipment. If there are no remaining shipments to be scheduled, the user is returned to the main menu page.

There are three options other than rating and scheduling shipments available to the user from the main menu page (Fig. **4**). If the user clicks on invoice inquiry button **26**, the user will be redirected to the invoice inquiry page (Fig. **13**). If the user clicks on shipment logs button **27** the user will be redirected to the tracking shipments page (Fig. **14**). If the user clicks on customized reports button **28** the user's browser will be redirected to the customized reports page (Fig. **15**).

Each of these pages performs a different function. The invoice inquiry page (Fig. **13**) permits the user to review the status of all service invoices. This permits the user to view the current status of their account with the service. Invoices in the currently preferred embodiment are displayed by invoice number, and show the date of the invoice, the due date, the prior balance, payments or credits, and the total due. Any reasonable alternate format could be used to present the data, and the data could be presented in any reasonable tabular format. The scroll bar **75** in this embodiment permits the user to scroll through the available invoices. The data is stored on the database server

2. Upon receipt of payment, the service will update the database server **2** to reflect the payment. This can be performed by a direct database operation, or any software adapted for the purpose of making changes to the database. A separate administrative web page, program, or server are three alternatives available in the present state of the art.

The shipment tracking page (Fig. **14**) permits the user to review the status of all shipments made by the user. This permits the user to view the current status of their shipments. Shipments in the currently preferred embodiment are initially displayed by the BOL number generated by the service, and the display shows the SCAC of the carrier performing the shipment, the date of the pickup, the date and time of the delivery, and the name of the recipient of the shipment. Any alternate format could be used to present the data, and the data could be presented in any format. The currently preferred embodiment displays the data in a tabular format. The scroll bar **76** in this embodiment permits the user to scroll up and down through the available shipments. In addition, if the user clicks on any of BOL number column heading **77**, SCAC column heading **78**, status column heading **79**, pickup column heading **80**, delivered column heading **81**, signature column heading **82** or time column heading **83**, the database server **2** will sort the shipments by the data contained in the column, and web server **1** will display shipment data in the resulting order. The data is stored on the database server **2**. Upon receipt of new information, the service will update the database server **2** to reflect the payment. This can be performed by a direct database operation, or any software adapted for the purpose of making changes to the database. A separate administrative web page, program, or server are three alternatives available in the present state of the art. In addition, the carriers themselves could be given limited access to the database via a customized web

page to update information for shipments made by each carrier. Print BOL button **84** permits the user to reprint the BOL for a selected shipment by clicking on the shipment's row and then clicking on print BOL button **84**. Print POD button **85** permits the user to print a POD report for a given shipment, again by clicking on the shipment's row and then clicking on print POD button **85**.

The customized reports page (Fig. **15**) permits the user access to cost reports, tracking reports, and custom reports for an account or sub-account. The user may choose any kind of report to generate or to schedule. If the user clicks on cost report button **86, 87** or **88,** the user will be given the opportunity to choose a location from the database of all locations shipped to or from. After choosing a location, the report will be printed, or scheduled to be run at a future time. By clicking on cost report button **86**, a report may be generated and may be printed for all shipments not yet invoiced to or from the location chosen. An example of the currently preferred run cost report page is shown at Figure **15A**, and a sample cost report is shown at Figure **15B.** By clicking on cost report button **86**, the user is redirected to a run cost report page. After filling in the information requested in origin zip box **87A** and destination zip box **87B** as well as date range start box **87C** and date range stop box **87D**, the user may indicate which method the user prefers to receive the report by, fax or email by clicking on radio buttons **87E**. After entering the destination information in box **87F** or **87G**, a report is generated when the submit button **87H** is clicked by the user, and the report is delivered via the method indicated by the user for any invoices in the date ranges chosen by the user for shipments to or from the location chosen. The report may be of any reasonable format, but the currently preferred format is shown in Figure **15B**. The reset button **87I** clears all fields. When the user clicks on cost report button **87**, the report may be generated for all shipments already invoiced

to or from the location chosen, using a run report page similar to that shown in Figure **15B**. When the user clicks on cost report button **88**, either of these reports may be scheduled to be run at a future time and shipped to the user via facsimile or e-mail, using a scheduling report page similar to the one shown in Figure **15B**, with the addition of date and time entry boxes to allow scheduling a future report run. The service will fax the report or e-mail the report over the distributed network at the time scheduled, automatically.

Likewise, if the user clicks on tracking report button **89**, **90** or **91**, the user will be given the opportunity to choose a location from the database of all locations shipped to or from. After choosing a location, the report may be printed, or scheduled to be run at a future time. By clicking on tracking report button **89**, a tracking report may be generated and may be printed for all shipments not yet invoiced to or from the location chosen. By clicking on tracking report button **90**, a report is generated and may be printed for all shipments already invoiced to or from the location chosen. When the user clicks on tracking report button **91**, either of these tracking reports may be scheduled to be run at a future time and shipped to the user via facsimile or e-mail. A sample of a tracking report page is shown at Figure **15C**, which operates similarly to the cost report pages described above, again with the addition of date and time entry boxes for future scheduling. An example of a tracking report in the currently preferred embodiment is shown at Figure **15D**. Both the tracking reports and the cost reports may be in any reasonable format.

As is shown, it is also possible to permit custom reports to be designed or run, using custom report buttons **92**, **93** or **94**. These buttons may permit the user to design a custom report based on any of the data stored in the database. These custom reports can then be run just like the tracking

and cost reports, either instantly or on a scheduled basis, with facsimile or e-mail delivery. Additionally, the user could request a special report to be designed, which would then be accessed via these boxes, similarly to the reports described above.

The manage sub-accounts page (Fig. **16**) may be reached by the user by directing their browser to the enrollment page. The manage sub-accounts page permits the user to create sub-accounts for master account information entered in master account information box. The user enters their access code in access code box **95** and their PIN in PIN box **96**. The service will recall and display the user's information in user information box **97**. The user may then access the sub-account management functions of the page. These may be presented in any reasonable format. In the currently preferred embodiment, the sub accounts are managed as follows:

By using the sub-account drop down box **102**, the user may access and alter already existing sub-accounts. Once the user has selected a sub-account using drop down box **102**, the service will permit access the sub-account information, recalling it from the database server **2**. Each sub-account may be allowed to rate and schedule, track, or view (depending on the settings of check boxes **100**, set by the user) reports for any set of locations in the database accessible by the user's master account. The user selects those locations for desired access and adds them using the add location button **104**. The service then modifies the database to reflect the sub-accounts access to the location added. The user may also alter or delete locations from the sub-account using the modify location button **107** and the delete location button **108**. By re-entering the PIN for the sub-account in PIN box **101** the user may alter the PIN for an individual sub-account. The status of the sub-account may be changed or set using status radio button **99**, and set to either subsidiary/affiliate or vendor/non-

affiliate. Once the user is done altering the sub-account, the user presses the save button **105**, and the service updates the database to reflect the changes or additions made by the user. The reset button **106** permits the user to reset the page to a neutral setting. Once the user has finished, the user may redirect their browser to another page.

The LTL rating process is described in the flowchart shown in Figure **17**. The LTL rating process is managed by the service. Once the user has input the rating data, the user chooses to rate the service by clicking 'rate', as described above. The database server **2** first runs a query against the database of carriers providing service to the zip codes chosen by the user, or determines the serviceable carriers **109**. The database server **2** then determines the base rate **110** for each carrier, which may be negotiated by the user's affiliation group or by the service. This step is performed for each serviceable carrier as determined above. The database server **2** then applies the appropriate carrier discount **111**, again determined from the database information as appropriate for the user's affiliation group or as negotiated by the service. This step is again performed for each serviceable carrier. If the resulting charge for the carrier is below their minimum charge, the service will apply the minimum charge instead of the calculated charge at the apply minimum charge step **114**. This step is also performed for each serviceable carrier. Finally, the system will apply the markup associated with the user or the user's affiliation group for each serviceable carrier at the apply markup step **115**. The resulting carriers and rates will then be displayed to the user by the web server in the form of a drop down box, as shown above.

It will be apparent to those of ordinary skill in the art that many changes and modifications could be made while remaining within the scope of the invention. It is intended to cover all such

equivalent methods or systems, and to limit the invention only as specifically delineated in the following claims.

It is readily apparent that the claimed invention may be embodied in a number of manners. Though the disclosed embodiment, and the currently preferred embodiment, is a series of web pages run on a web server **1** and a database server **2**, the invention could be a network-based program run over a distributed system, a set of web pages run on a single server or distributed server, or any other alternative which may be immediately apparent to one skilled in the art, and that advances in distributed networks may make possible embodiments which are not presently available without making substantial changes to the invention.

The above description is not intended to limit the meaning of the words used in the following claims that define the invention. Rather, it is contemplated that future modifications in structure, function or result will exist that are not substantial changes and that all such insubstantial changes in what is claimed are intended to be covered by the claims.

What is claimed is:

1. A computer based system for reducing errors in freight services and billing comprising:

a) a server computer;

b) a distributed network connected to the server computer;

c) a user computer connected to the distributed network which can interact with the server computer; and

d) a database on the server computer containing accessorial service information;

e) programs or software for displaying accessorial services and requiring the user to address accessorial services offered and to select those accessorial services desired.

2. The system of claim 1 wherein each accessorial service must be addressed individually.

3. The system of claim 2 wherein the user is not permitted to complete the transaction until each service has been addressed.

4. The system of claim 1 wherein after completion of the selection a summary of services selected is presented to the user.

5. The system of claim 1 wherein after completion of the selection a summary of services selected and services rejected is presented.

6. The system of claim 1 wherein the accessorial services are presented as a list.

7. The system of claim 6 wherein the user is not permitted to complete the transaction until at least one element of the list has been selected by the user, or no service has been affirmatively selected by the user.

8. A computer based system for reducing errors in freight services and billing comprising:

a) a server computer;

b) a distributed network connected to the server computer;

c) a user computer connected to the distributed network which can interact with the server computer; and

d) a database on the server computer containing stored data comprising previously input user information;

e) programs or software for reconciling new user input information with said stored data to reduce errors.

9. The system of claim 8 wherein the user is prompted to re-input information if an inconsistency is found between the new user input and said stored data.

10. The system of claim 8 wherein input zip code information is used to reconcile the new user input with said stored data.

11. The system of claim 8 wherein the user is prompted to select between the stored data and the new user input.

12. The system of claim 8 wherein the user is provided an opportunity to select either the stored data or the new user input.

13. The system of claim 8 wherein the user is provided an opportunity to select either stored data or the new user input to edit as a further new user input.

14. The system of claim 13 wherein said further new user input is reconciled against the stored data.

5

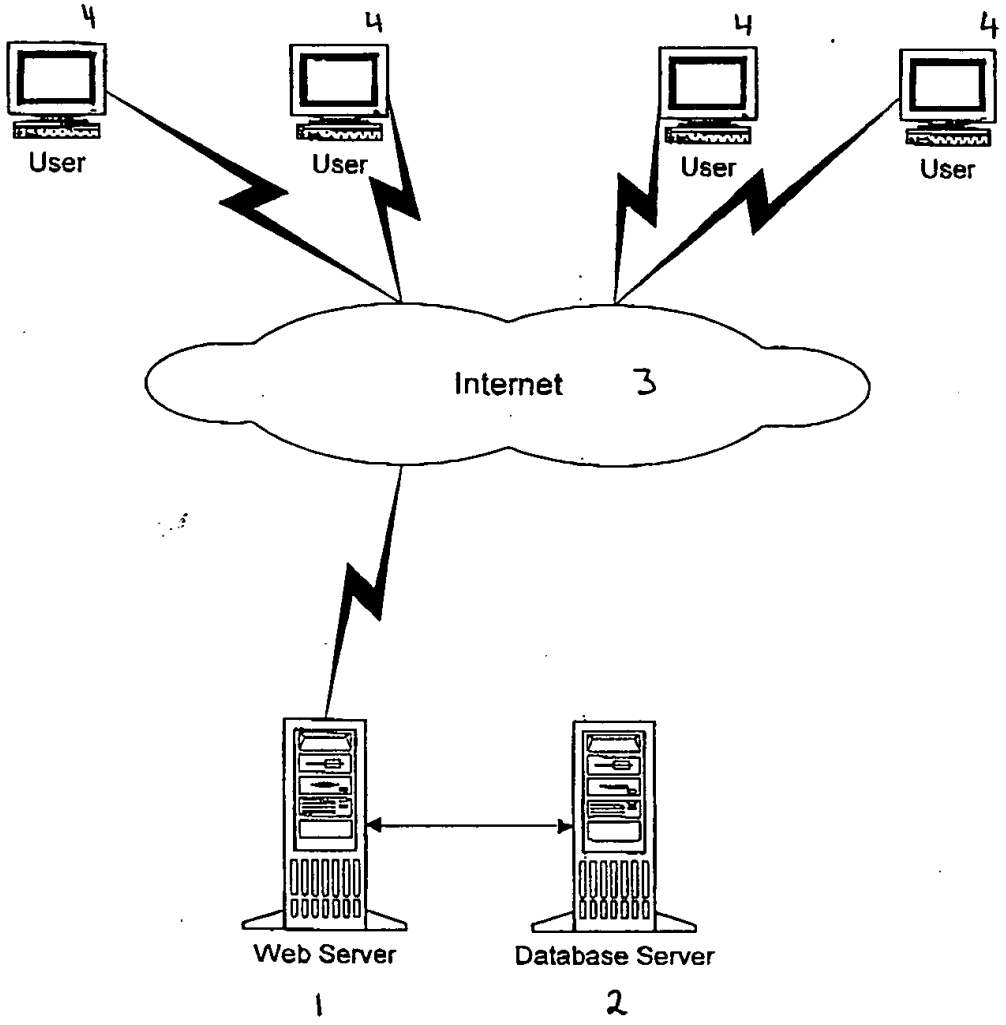
4
4
4
4
User
User
User
User
Internet
3
Web Server
1
Database Server
2

FIGURE 1

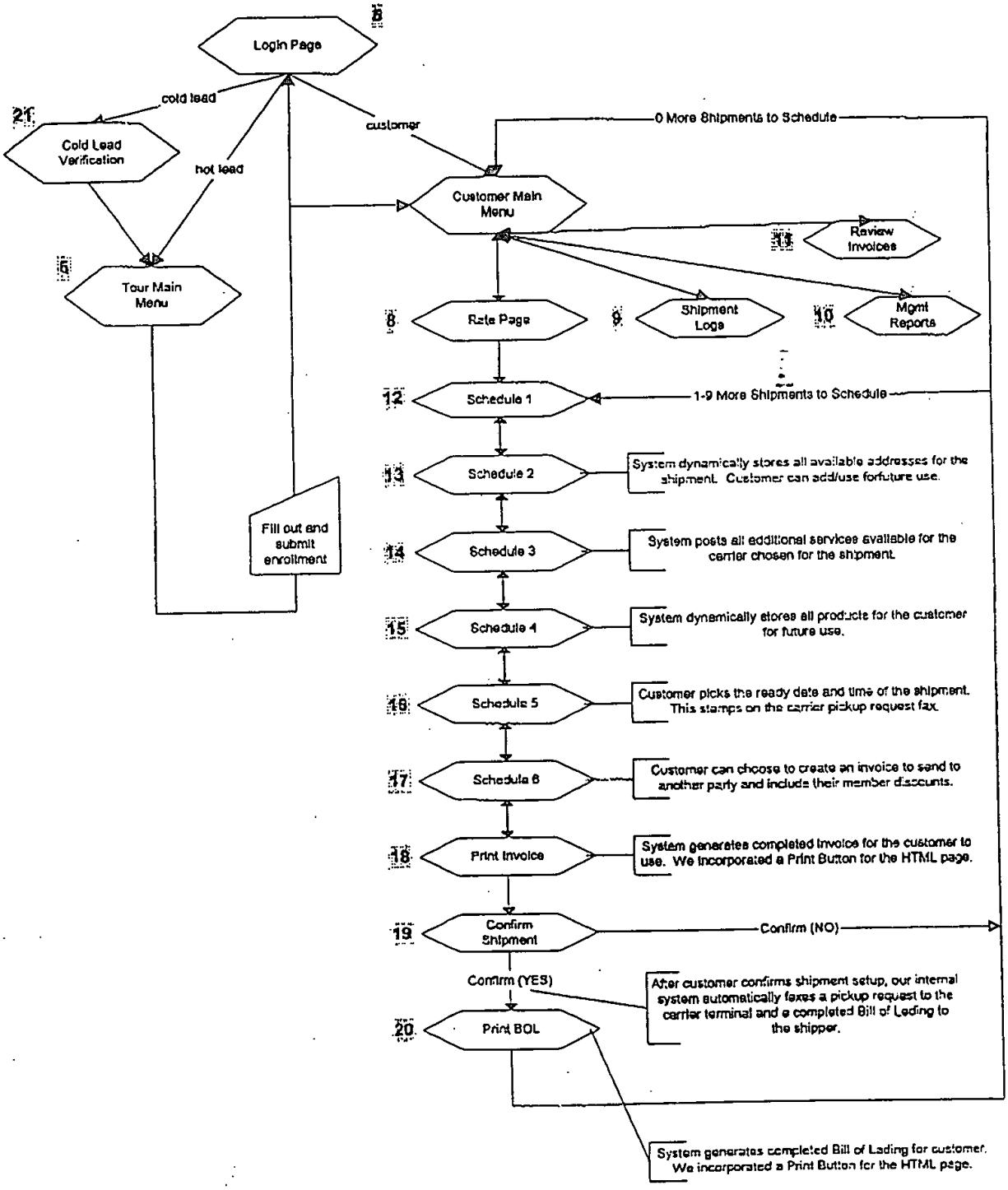
Login Page
cold lead
customer
hot lead
Cold Lead Verification
Tour Main Menu
Fill out and submit enrollment
Customer Main Menu
0 More Shipments to Schedule
Review Invoices
Mgmt Reports
Shipment Logs
Rate Page
Schedule 1
1-9 More Shipments to Schedule
Schedule 2
System dynamically stores all available addresses for the shipment. Customer can add/use forfuture use.
Schedule 3
System posts all additional services available for the carrier chosen for the shipment.
Schedule 4
System dynamically stores all products for the customer for future use.
Schedule 5
Customer picks the ready date and time of the shipment. This stamps on the carrier pickup request fax.
Schedule 6
Customer can choose to create an invoice to send to another party and include their member discounts.
Print Invoice
System generates completed invoice for the customer to use. We incorporated a Print Button for the HTML page.
Confirm Shipment
Confirm (NO)
Confirm (YES)
After customer confirms shipment setup, our internal system automatically faxes a pickup request to the carrier terminal and a completed Bill of Lading to the shipper.
Print BOL
System generates completed Bill of Lading for customer. We incorporated a Print Button for the HTML page.

FIGURE 2

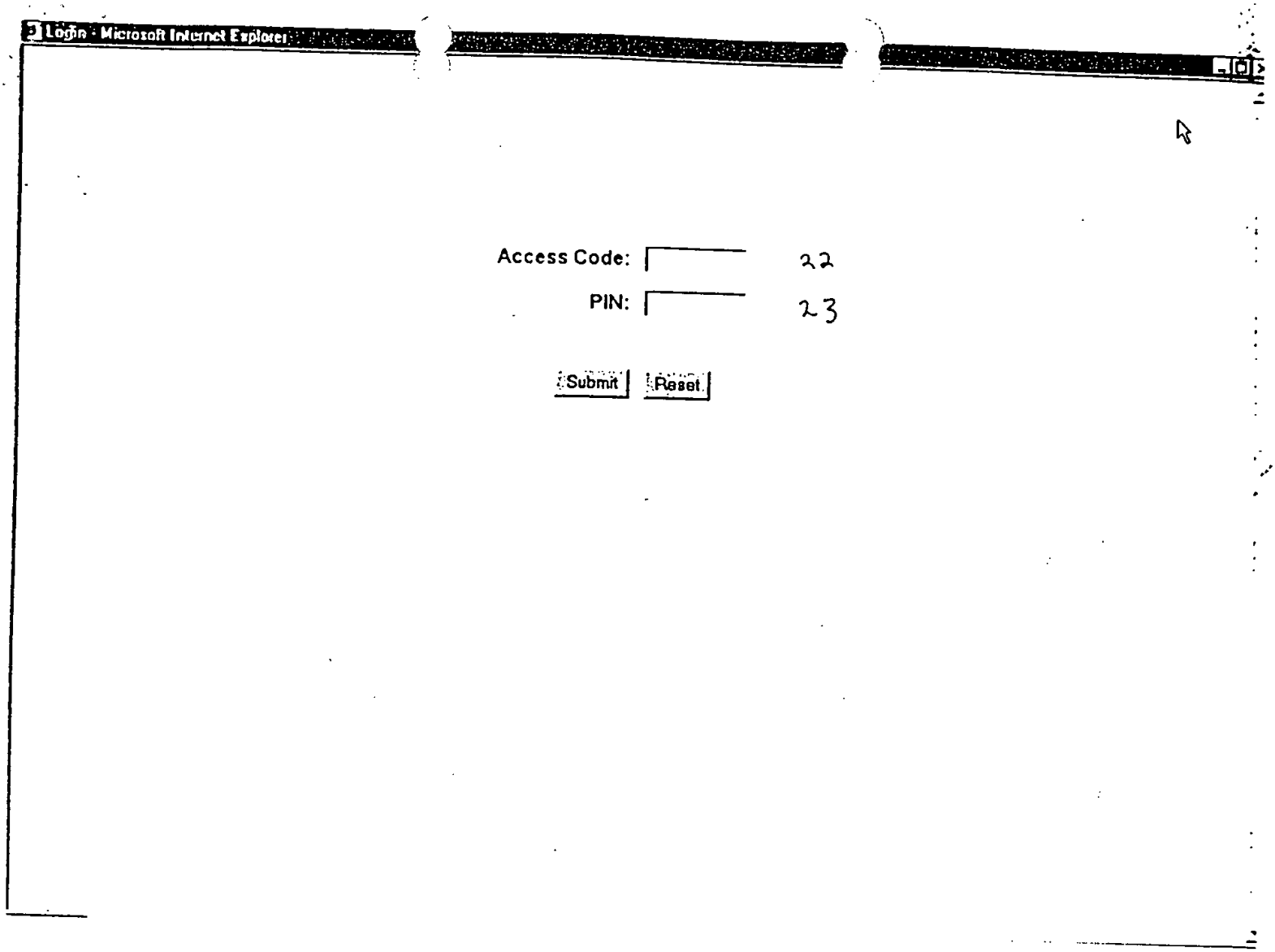
Login - Microsoft Internet Explorer
Access Code:
22
PIN:
23
Submit
Reset

FIGURE 3

Association Member Benefits 24

ABC Company
585 Main Street 29
Anytown KS 66202

(Click a menu item)

LTL Rate & Schedule Pickup 25

Invoice Inquiry 26

Shipment Logs 27

Customized Reports 28

FIGURE 4

Association Member Benefits 24

Rate Your LTL Shipments

	Origin Zip	Dest. Zip	Class	Total Wt.	35 Member Price	36 Carrier SCAC	37 Est. Transit (days)	38 Arrange pickup
1.	66202	55125	70	1251	$185.03	CFWY	1	(•) Yes ( ) No
2.	94544	66202	50	5230	$713.18	CFWY	3	(•) Yes ( ) No
3.	94544	85024	70	3212	$431.64	CRNT	1	( ) Yes (•) No
4.	33124	64111	Multiple	810	$165.86	ODFL	2	(•) Yes ( ) No
5.					Rate			( ) Yes ( ) No
6.								( ) Yes ( ) No
7.								( ) Yes ( ) No
8.								( ) Yes ( ) No
9.								( ) Yes ( ) No
10.								( ) Yes ( ) No
	30	31	32	33	34			39

When you have completed rating all of your shipments and selected the shipments for pickup arrangement, click here.

Next >>

40

FIGURE 5

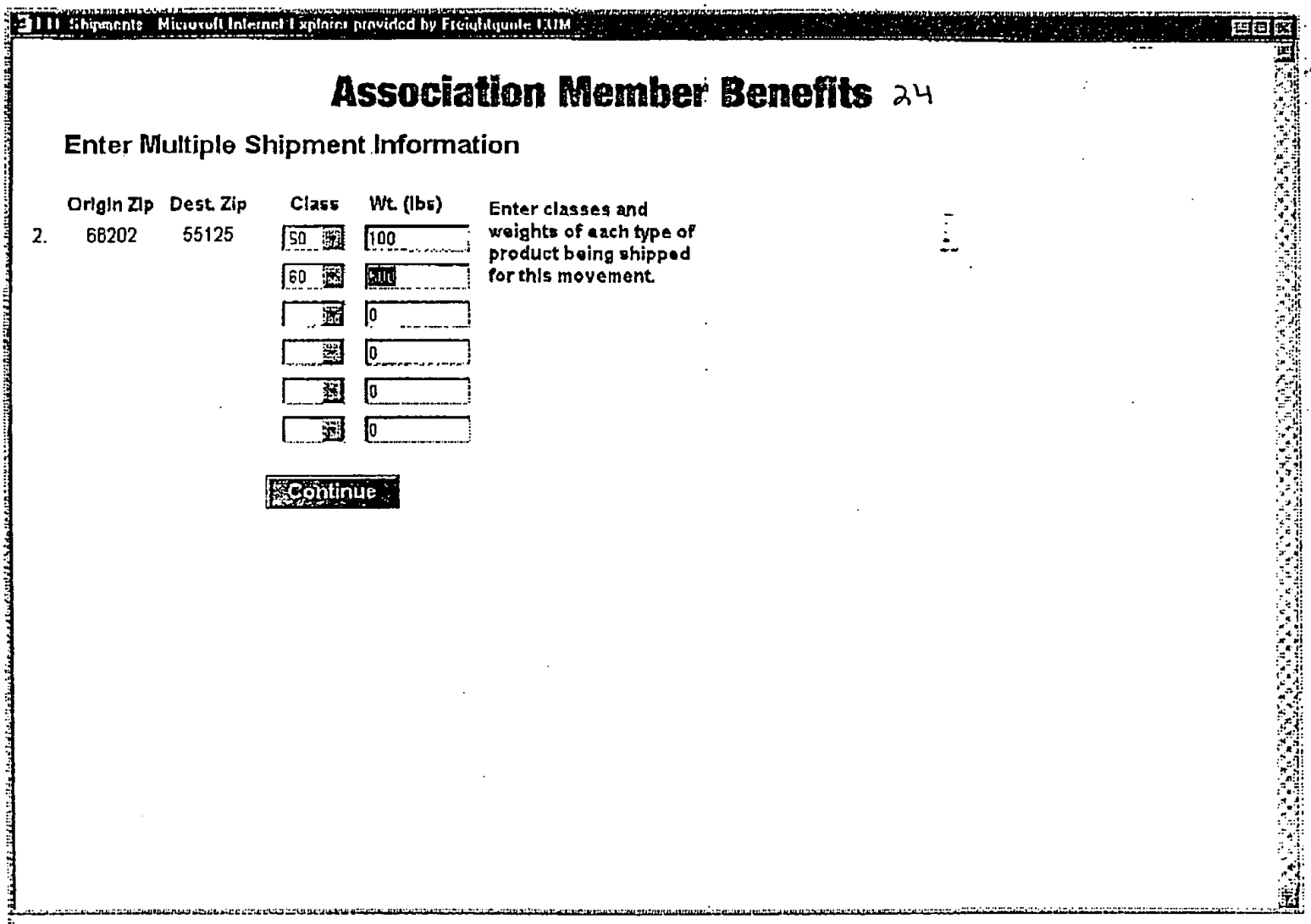
Shipments Microsoft Internet Explorer provided by FreightQuote.COM
Association Member Benefits 24
Enter Multiple Shipment Information
Origin Zip
Dest. Zip
Class
Wt. (lbs)
2.
66202
55125
50
100
60
100
0
0
0
0
Enter classes and weights of each type of product being shipped for this movement.
Continue

FIGURE 5A

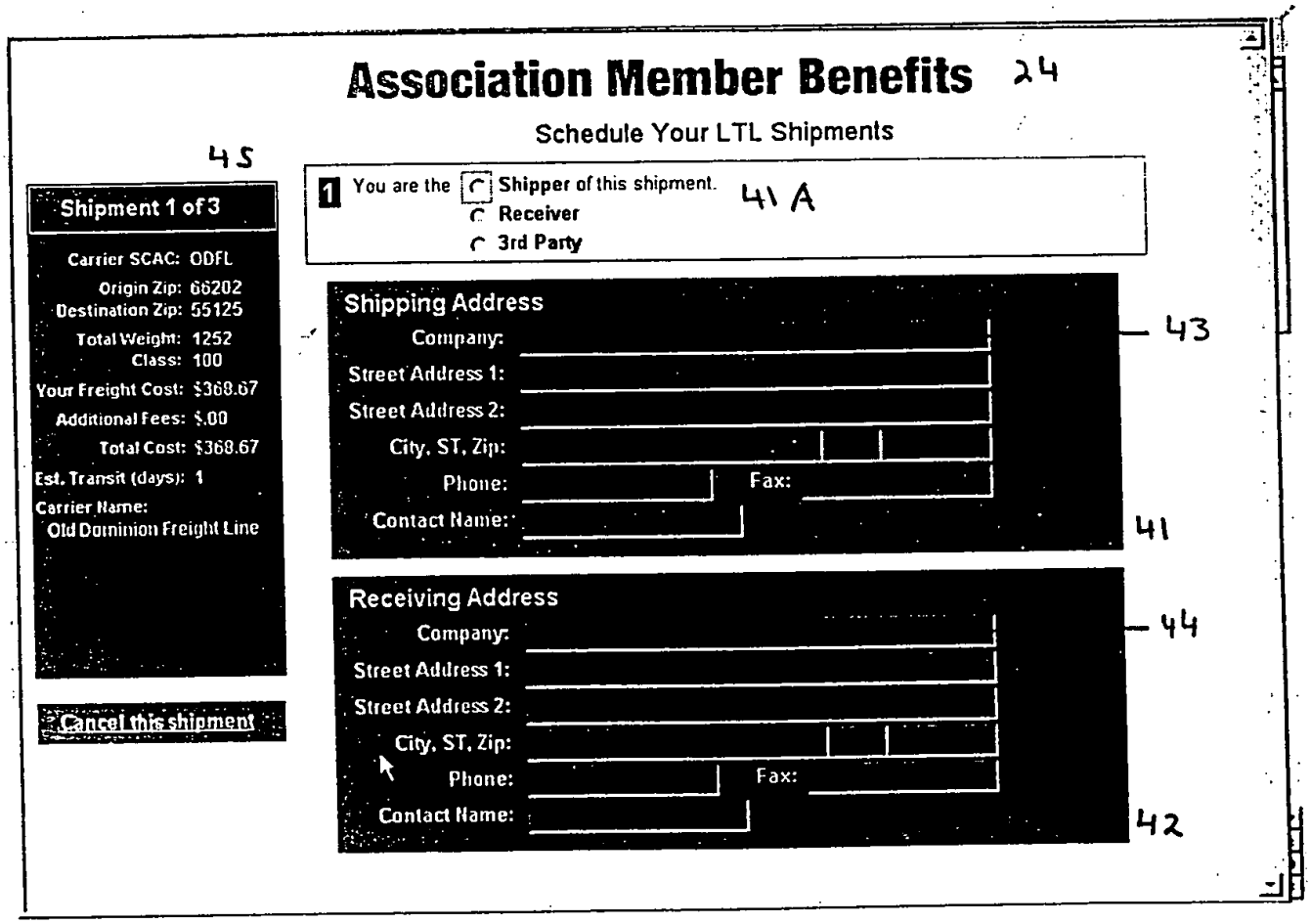
Association Member Benefits
24
Schedule Your LTL Shipments
45
Shipment 1 of 3
Carrier SCAC: ODFL
Origin Zip: 66202
Destination Zip: 55125
Total Weight: 1252
Class: 100
Your Freight Cost: $368.67
Additional Fees: $.00
Total Cost: $368.67
Est. Transit (days): 1
Carrier Name:
Old Dominion Freight Line
Cancel this shipment
1 You are the Shipper of this shipment.
Receiver
3rd Party
41 A
Shipping Address
Company:
Street Address 1:
Street Address 2:
City, ST, Zip:
Phone:
Fax:
Contact Name:
43
41
Receiving Address
Company:
Street Address 1:
Street Address 2:
City, ST, Zip:
Phone:
Fax:
Contact Name:
44
42

FIGURE 6

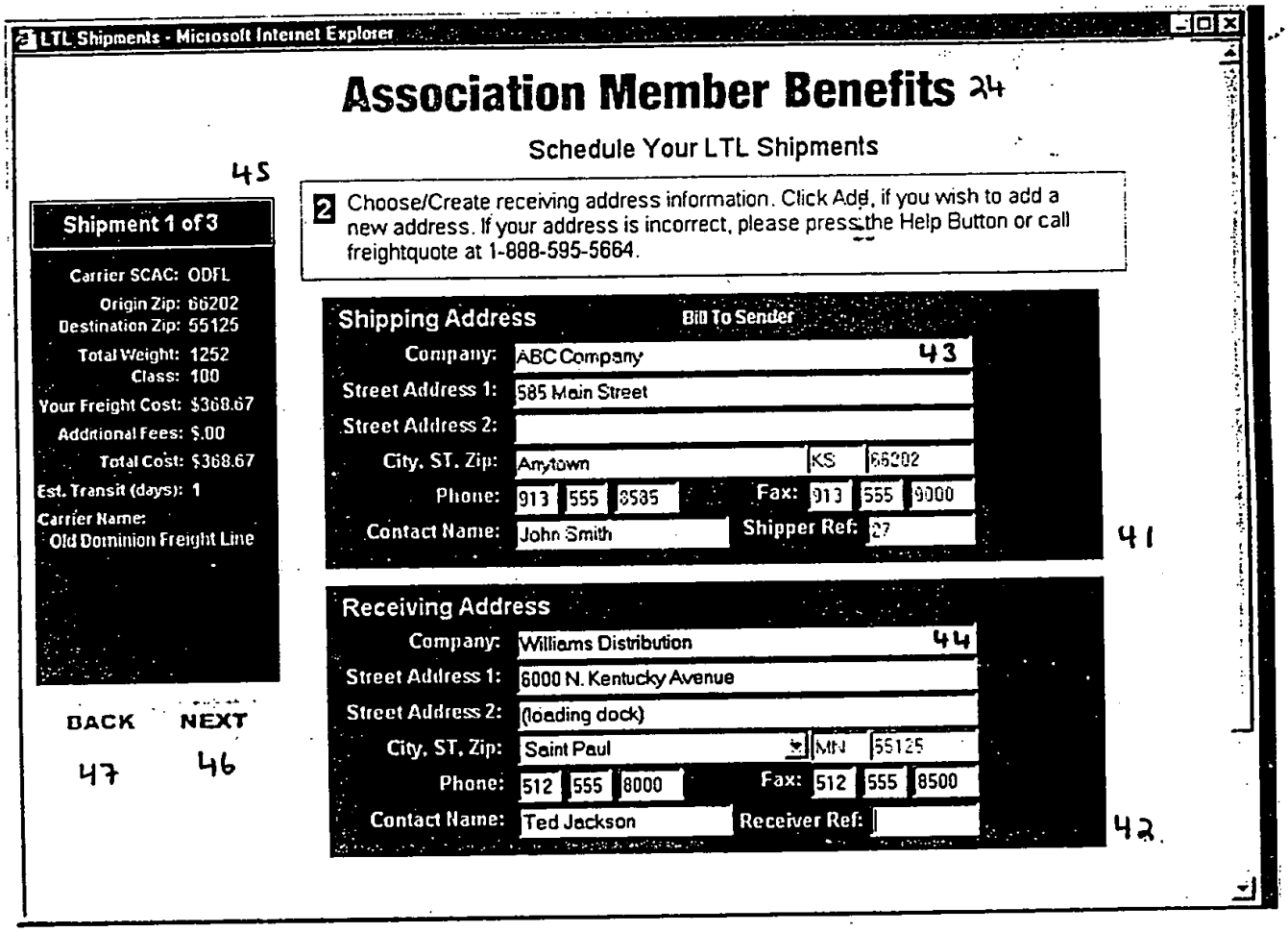
LTL Shipments - Microsoft Internet Explorer
Association Member Benefits 24
Schedule Your LTL Shipments
45
Shipment 1 of 3
Carrier SCAC: ODFL
Origin Zip: 66202
Destination Zip: 55125
Total Weight: 1252
Class: 100
Your Freight Cost: $368.67
Additional Fees: $.00
Total Cost: $368.67
Est. Transit (days): 1
Carrier Name:
Old Dominion Freight Line
BACK
NEXT
47
46
2 Choose/Create receiving address information. Click Add, if you wish to add a new address. If your address is incorrect, please press the Help Button or call freightquote at 1-888-595-5664.
Shipping Address
Bill To Sender
Company: ABC Company
43
Street Address 1: 585 Main Street
Street Address 2:
City, ST, Zip: Anytown KS 66202
Phone: 913 555 8585
Fax: 913 555 9000
Contact Name: John Smith
Shipper Ref: 27
41
Receiving Address
Company: Williams Distribution
44
Street Address 1: 6000 N. Kentucky Avenue
Street Address 2: (loading dock)
City, ST, Zip: Saint Paul MN 55125
Phone: 512 555 8000
Fax: 512 555 8500
Contact Name: Ted Jackson
Receiver Ref:
42

FIGURE 6A

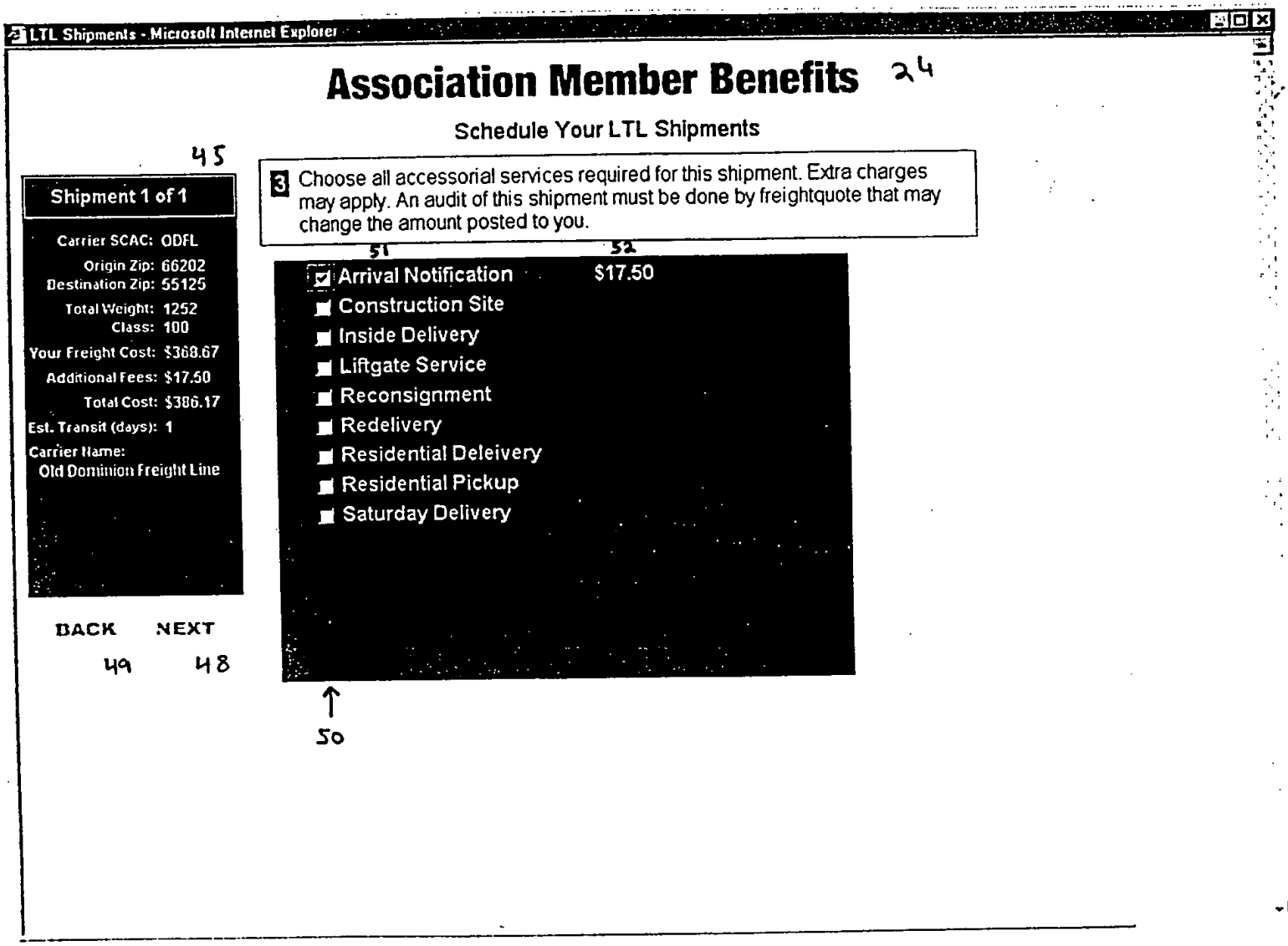
LTL Shipments - Microsoft Internet Explorer
Association Member Benefits
24
Schedule Your LTL Shipments
45
Shipment 1 of 1
Carrier SCAC: ODFL
Origin Zip: 66202
Destination Zip: 55125
Total Weight: 1252
Class: 100
Your Freight Cost: $368.67
Additional Fees: $17.50
Total Cost: $386.17
Est. Transit (days): 1
Carrier Name:
Old Dominion Freight Line
BACK
NEXT
49
48
3 Choose all accessorial services required for this shipment. Extra charges may apply. An audit of this shipment must be done by freightquote that may change the amount posted to you.
51
52
Arrival Notification
$17.50
Construction Site
Inside Delivery
Liftgate Service
Reconsignment
Redelivery
Residential Deleivery
Residential Pickup
Saturday Delivery
50

FIGURE 7

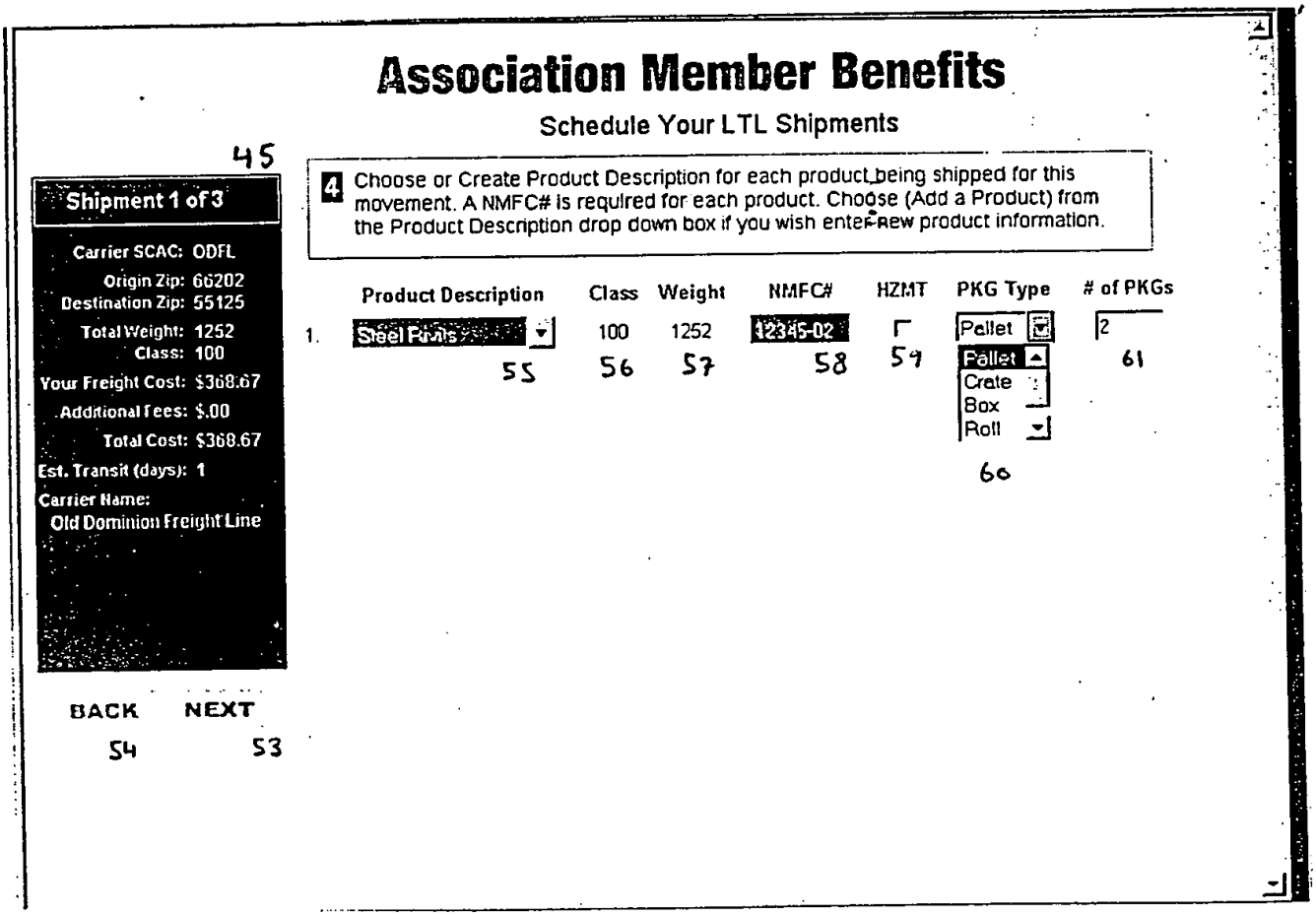
Association Member Benefits
Schedule Your LTL Shipments
45
Shipment 1 of 3
Carrier SCAC: ODFL
Origin Zip: 66202
Destination Zip: 55125
Total Weight: 1252
Class: 100
Your Freight Cost: $368.67
Additional Fees: $.00
Total Cost: $368.67
Est. Transit (days): 1
Carrier Name:
Old Dominion Freight Line
BACK
NEXT
54
53
4 Choose or Create Product Description for each product being shipped for this movement. A NMFC# is required for each product. Choose (Add a Product) from the Product Description drop down box if you wish enter new product information.
Product Description
Class
Weight
NMFC#
HZMT
PKG Type
# of PKGs
1.
Steel Parts
100
1252
12345-02
Pallet
2
55
56
57
58
59
Pallet
Crate
Box
Roll
60
61

FIGURE 8

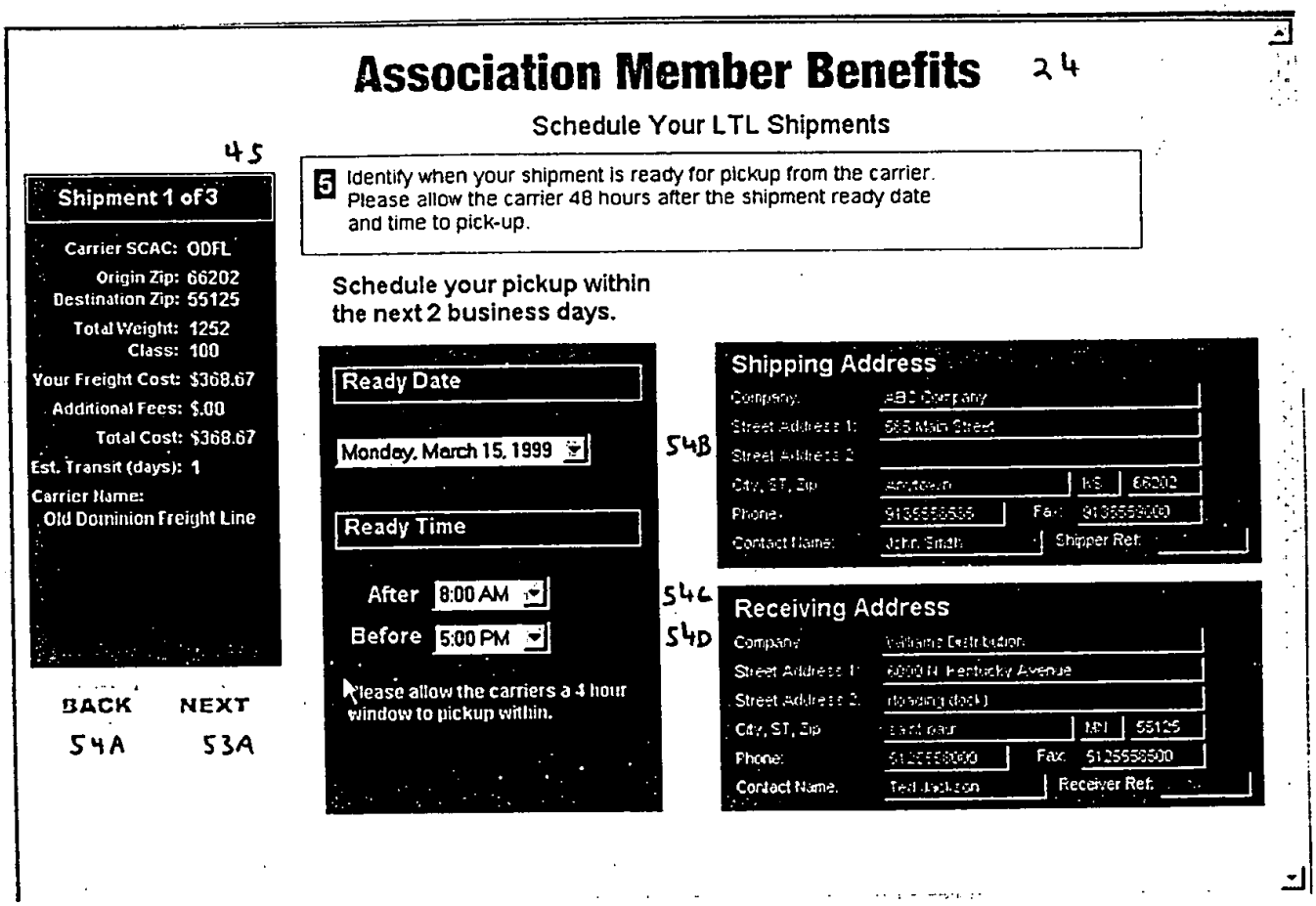
Association Member Benefits
24
Schedule Your LTL Shipments
45
Shipment 1 of 3
Carrier SCAC: ODFL
Origin Zip: 66202
Destination Zip: 55125
Total Weight: 1252
Class: 100
Your Freight Cost: $368.67
Additional Fees: $.00
Total Cost: $368.67
Est. Transit (days): 1
Carrier Name:
Old Dominion Freight Line
BACK
NEXT
54A
53A
5 Identify when your shipment is ready for pickup from the carrier. Please allow the carrier 48 hours after the shipment ready date and time to pick-up.
Schedule your pickup within the next 2 business days.
Ready Date
Monday, March 15, 1999
Ready Time
After 8:00 AM
Before 5:00 PM
Please allow the carriers a 4 hour window to pickup within.
54B
Shipping Address
Company:
Street Address 1:
Street Address 2:
City, ST, Zip
Phone:
Fax:
Contact Name:
John Smith
Shipper Ref:
54C
54D
Receiving Address
Company:
Street Address 1:
Street Address 2:
(receiving dock)
City, ST, Zip
MN
55125
Phone:
Fax:
Contact Name:
Receiver Ref:

FIGURE 8A

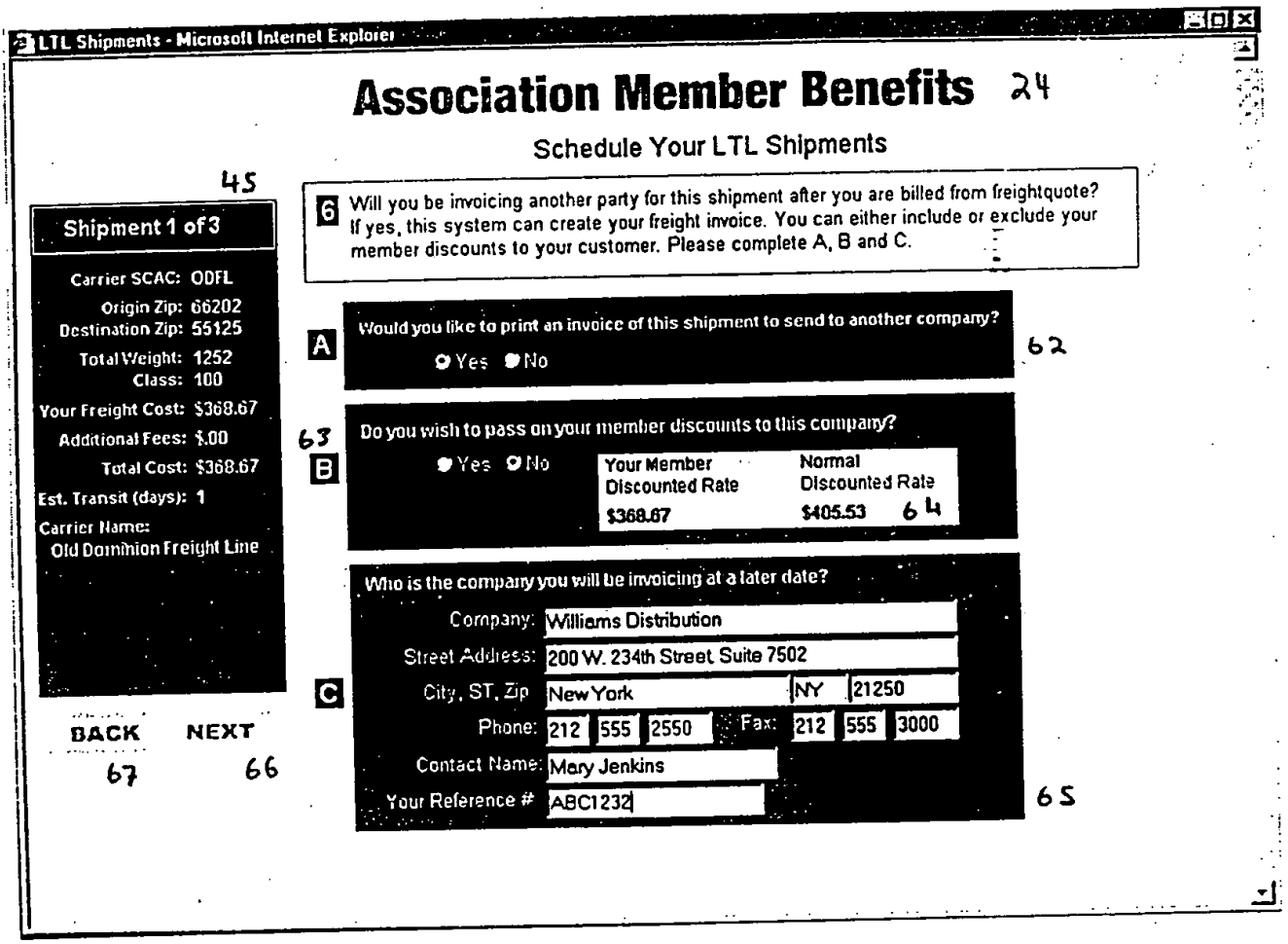
LTL Shipments - Microsoft Internet Explorer
Association Member Benefits
24
Schedule Your LTL Shipments
45
Shipment 1 of 3
Carrier SCAC: ODFL
Origin Zip: 66202
Destination Zip: 55125
Total Weight: 1252
Class: 100
Your Freight Cost: $368.67
Additional Fees: $.00
Total Cost: $368.67
Est. Transit (days): 1
Carrier Name:
Old Dominion Freight Line
BACK
NEXT
67
66
6 Will you be invoicing another party for this shipment after you are billed from freightquote? If yes, this system can create your freight invoice. You can either include or exclude your member discounts to your customer. Please complete A, B and C.
A
Would you like to print an invoice of this shipment to send to another company?
Yes No
62
63
B
Do you wish to pass on your member discounts to this company?
Yes No
Your Member Discounted Rate
$368.67
Normal Discounted Rate
$405.53
64
C
Who is the company you will be invoicing at a later date?
Company: Williams Distribution
Street Address: 200 W. 234th Street Suite 7502
City, ST, Zip: New York NY 21250
Phone: 212 555 2550 Fax: 212 555 3000
Contact Name: Mary Jenkins
Your Reference #: ABC1232
65

FIGURE 9

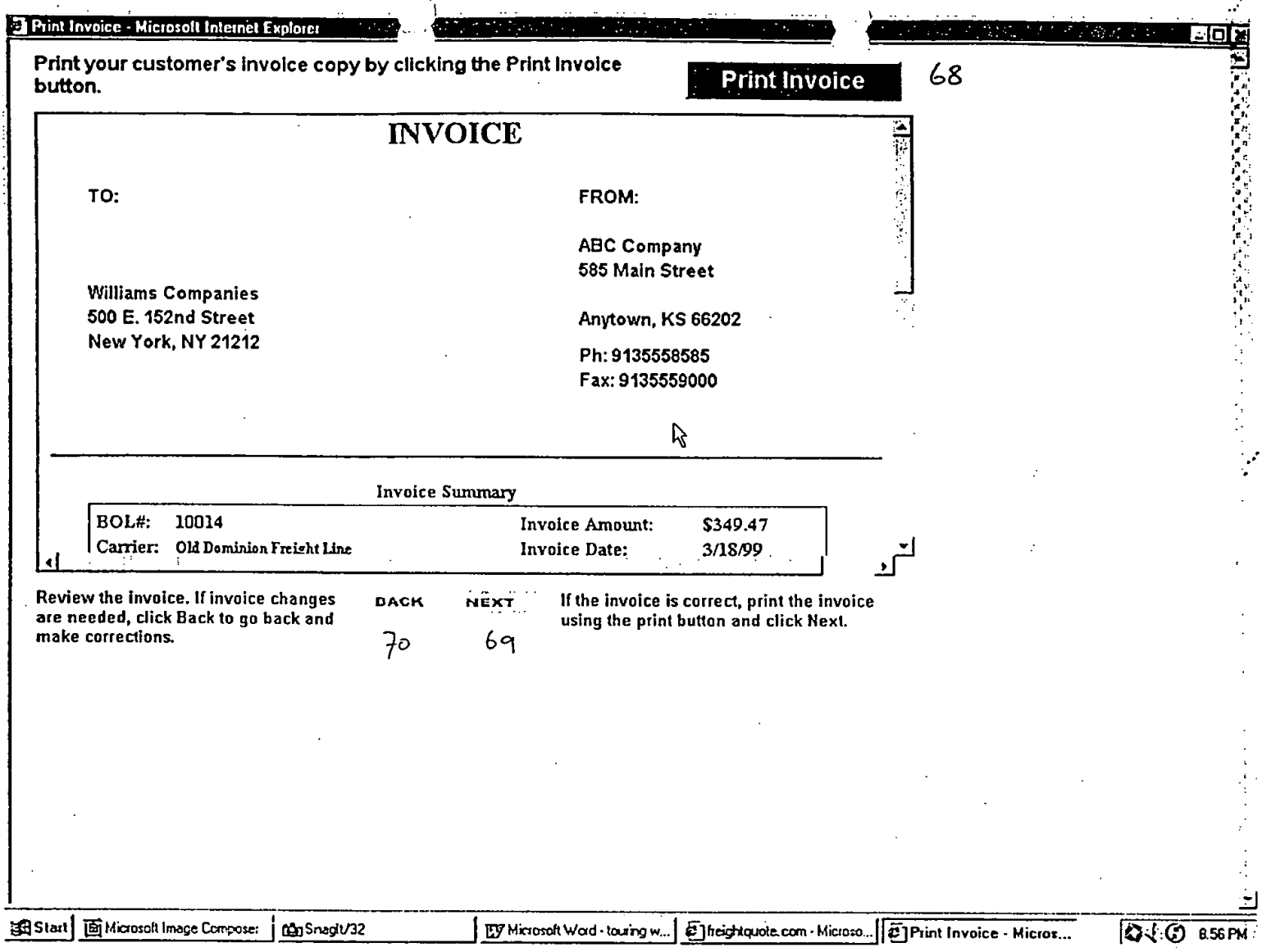
Print Invoice - Microsoft Internet Explorer
Print your customer's invoice copy by clicking the Print Invoice button.
Print Invoice
68
INVOICE
TO:
Williams Companies
500 E. 152nd Street
New York, NY 21212
FROM:
ABC Company
585 Main Street
Anytown, KS 66202
Ph: 9135558585
Fax: 9135559000
Invoice Summary
BOL#: 10014
Carrier: Old Dominion Freight Line
Invoice Amount: $349.47
Invoice Date: 3/18/99
Review the invoice. If invoice changes are needed, click Back to go back and make corrections.
BACK
70
NEXT
69
If the invoice is correct, print the invoice using the print button and click Next.
Start
Microsoft Image Composer
SnagIt/32
Microsoft Word - touring w...
freightquote.com - Microso...
Print Invoice - Micros...
8:56 PM

FIGURE 10

Association Member Benefits 24

Press OK to complete this shipment and print Bill of Lading (BOL).

1. If you are not the sender, please notify them regarding this movement and fax a copy of the completed Bill of Lading to the sender. The sender must use our generated Bill of Lading (BOL) in order for you to receive accurate pricing and shipment processing.
2. The carrier will pick up your freight within 48 hours of the scheduled Ready Date and Time. You do not need to contact the carrier for pickup.
3. We will invoice you at the end of the month for this movement. If any freight information changes for this movement, additional freight charges or fees may be added to this movement's cost after shipment auditing (1-4 weeks).

OK

Cancel Movement

72 71

FIGURE 11

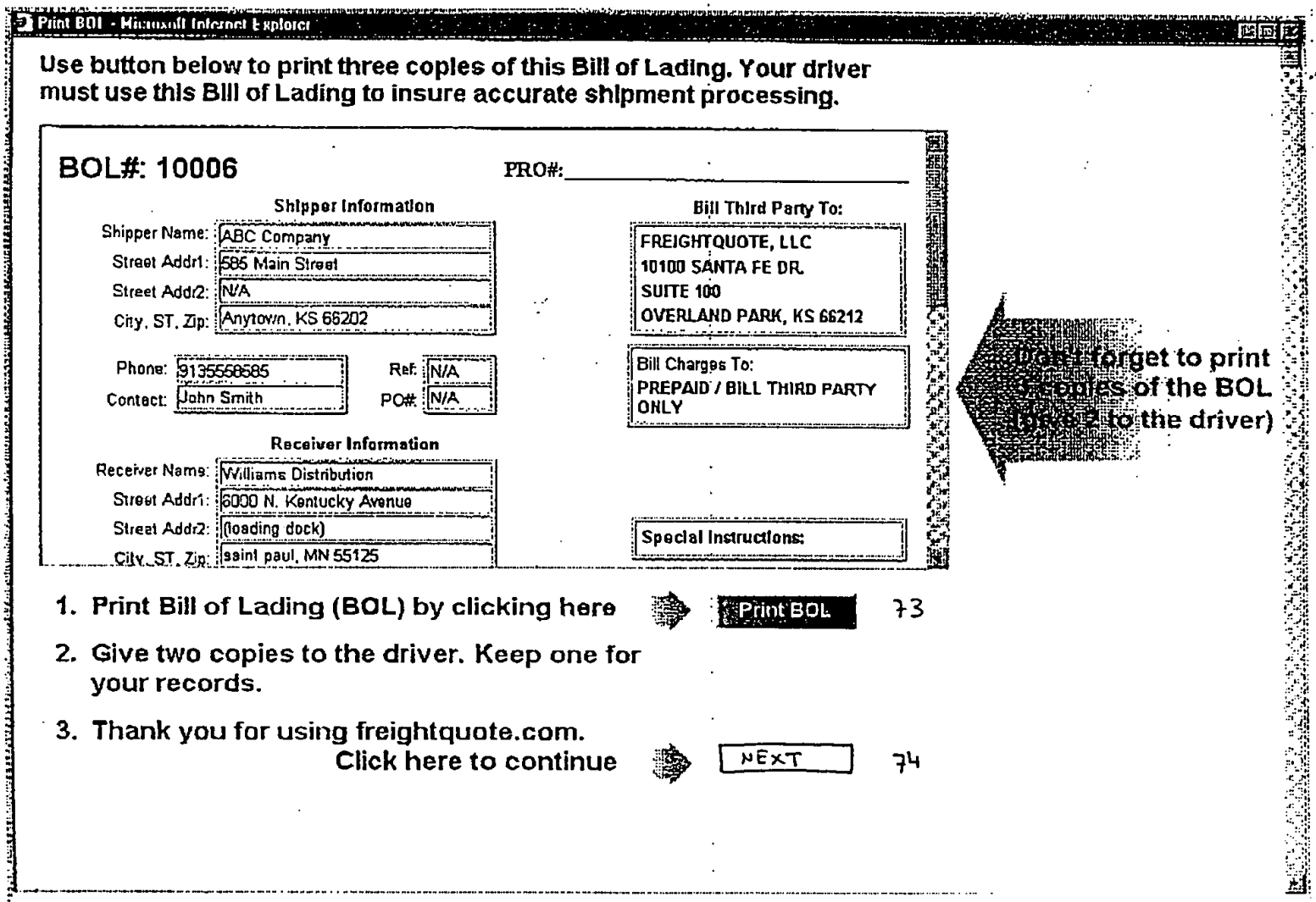
Print BOL - Microsoft Internet Explorer
Use button below to print three copies of this Bill of Lading. Your driver must use this Bill of Lading to insure accurate shipment processing.
BOL#: 10006
PRO#:
Shipper Information
Shipper Name: ABC Company
Street Addr1: 585 Main Street
Street Addr2: N/A
City, ST, Zip: Anytown, KS 66202
Phone: 9135558585
Contact: John Smith
Ref: N/A
PO#: N/A
Receiver Information
Receiver Name: Williams Distribution
Street Addr1: 6000 N. Kentucky Avenue
Street Addr2: (loading dock)
City, ST, Zip: saint paul, MN 55125
Bill Third Party To:
FREIGHTQUOTE, LLC
10100 SANTA FE DR.
SUITE 100
OVERLAND PARK, KS 66212
Bill Charges To:
PREPAID / BILL THIRD PARTY ONLY
Special Instructions:
Don't forget to print 3 copies of the BOL (Give 2 to the driver)
1. Print Bill of Lading (BOL) by clicking here
Print BOL
73
2. Give two copies to the driver. Keep one for your records.
3. Thank you for using freightquote.com.
Click here to continue
NEXT
74

FIGURE 12

Association Member Benefits 24

Inv#	Inv Date	Due Date	Prior Bal	New Charges	Payments/Crdts	Total Due
123456	2/28/1999	3/20/1999	0	252.12	0	252.12
145678	3/31/1999	4/20/1999	252.12	558.15	252.12	558.15
156789	4/30/1999	5/20/1999	558.15	1020.60	500.00	1079.62*
178922	5/31/1999	6/20/1999	1079.62	1150.50	1079.62	1150.50
165678	6/30/1999	7/20/1999	252.12	558.15	252.12	558.15
176789	7/31/1999	8/20/1999	1079.62	1150.50	1079.62	1150.50

* Includes a 1.5% finance charge added to unpaid prior balance

FIGURE 13

Association Member Benefits 24

Click on the column you wish to arrange your shipments by. Highlight the desired shipment and click Print BOL (Bill of Lading), or Print POD (Proof of Delivery).

BOL Number (77)	SCAC (78)	Status (79)	Picked UP (80)	Delivered (81)	Signed By (82)	Time (83)
1234567800001	AMER	PENDING	4/03/1999			
1234567800002	ODFL	PENDING	4/04/1999			
1234567800003	CFWY	IN TRANSIT	4/02/1999			
1234567800004	CFWY	IN TRANSIT	4/02/1999			
1234567800005	AMER	DELIVERED	3/15/1999	3/17/1999	J SMITH	13:45
1234567800006	DAFG	DELIVERED	3/02/1999	3/05/1999	R JOHNSON	13:45

Print BOL (84) Print POD (85)

FIGURE 14

Click on the report you wish to run. Autorun Reports are highlighted in Blue (you will automatically receive these reports).

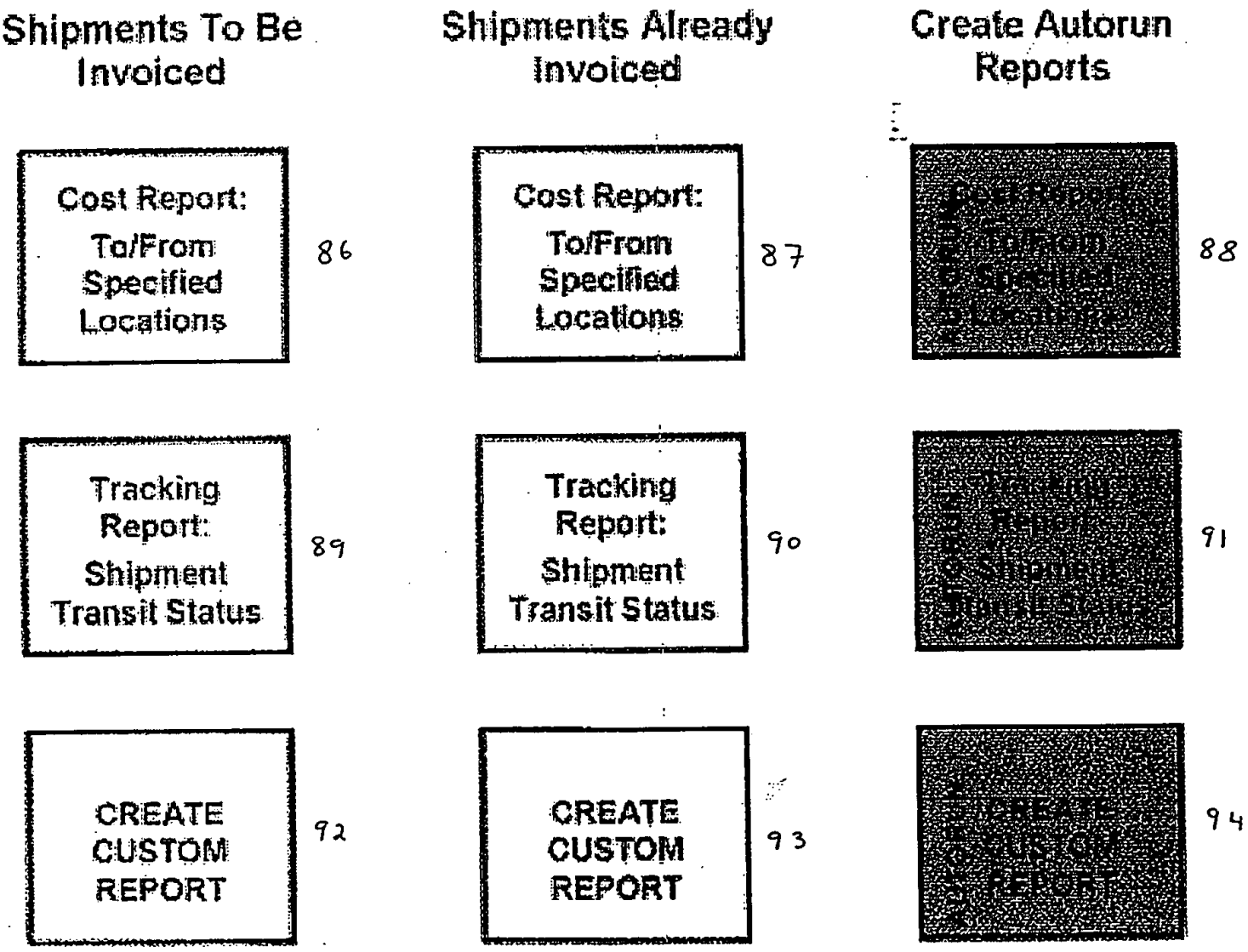

FIGURE 15

Run Cost Report

Report 1: Zip Code Range

	Origin (87A)		Destination (87B)
Locations	66212	to	ALL

	Start		Stop
Date Range	1/1/1999 (87C)	to	1/31/1999 (87D)

(87E) ◉ Email to jsmith@abc-company.net (87F)

○ Fax to (87G)

Submit (87H) Reset (87I)

FIGURE 15A

Report Name: **Billing Summary** Report Date: 3-May-99

from: **1-Jan-99** **to** **31-Jan-99**

Report on:
Master Account
ABC Company
123 South Main Street
Overland Park, KS 66212

Report to:
Master Account
ABC Company
123 South Main Street
Overland Park, KS 66212

	BOL#	Ship Date	Delivered	Weight	Cost
1	100001	1/1/99	1/4/99	120	$68.50
2	100002	1/1/99	1/4/99	100	$85.23
3	100003	1/1/99	1/4/99	656	$122.20
4	100004	1/5/99	1/8/99	230	$51.12
5	100005	1/5/99	1/8/99	58	$40.00
6	100006	1/10/99	1/14/99	502	$98.90
7	100007	1/10/99	1/14/99	650	$225.25
8	100008	1/10/99	1/15/99	250	$100.20
9	100009	1/11/99	1/15/99	120	$68.50
10	100010	1/15/99	1/19/99	50	$60.20
11	100011	1/15/99	1/23/99	220	$122.20
12	100012	1/23/99	1/25/99	262	$51.90
13	100013	1/23/99	1/26/99	120	$64.50
14	100014	1/23/99	1/26/99	85	$85.82
15	100015	1/23/99	1/29/99	1252	$321.01
16					
17					
18					
19					
20					

Total Page 1: **$1,565.53**

Overall Total: **$1,565.53** **Average:** **$104.37**

FIGURE 15B

Run Tracking Report

Report 1: Zip Code Range

	Origin		Destination
Locations	66212	to	55125
	Start		**Stop**
Date Range	1/5/1999	to	1/31/1999

(•) Email to jsmith@abc-company.net

( ) Fax to

Submit Reset

FIGURE 15C

Report Name: **Transit Summary** Report Date: 6-May-99

from: **1-Jan-99** to **31-Jan-99**

Report on:
Affiliate Account
ABC Company
555 Williamsburg Ave
Dayton, OH 55125

Report to:
Master Account
ABC Company
123 South Main Street
Overland Park, KS 66212

	BOL#	Ship Date	Delivered	Weight	Transit Days
1	100001	1/1/99	1/4/99	120	1
2	100002	1/1/99	1/4/99	100	1
3	100003	1/1/99	1/4/99	656	3
4	100004	1/5/99	1/8/99	230	3
5	100005	1/5/99	1/8/99	58	3
6	100006	1/10/99	1/14/99	502	3
7	100007	1/10/99	1/14/99	650	4
8	100008	1/10/99	1/15/99	250	5
9	100009	1/11/99	1/15/99	120	4
10	100010	1/15/99	1/19/99	50	2
11	100011	1/15/99	1/23/99	220	6
12	100012	1/23/99	1/25/99	262	1
13	100013	1/23/99	1/26/99	120	2
14	100014	1/23/99	1/26/99	85	2
15	100015	1/23/99	1/29/99	1252	5
16					
17					
18					
19					
20					
				Avg. Transit:	3

FIGURE 15D

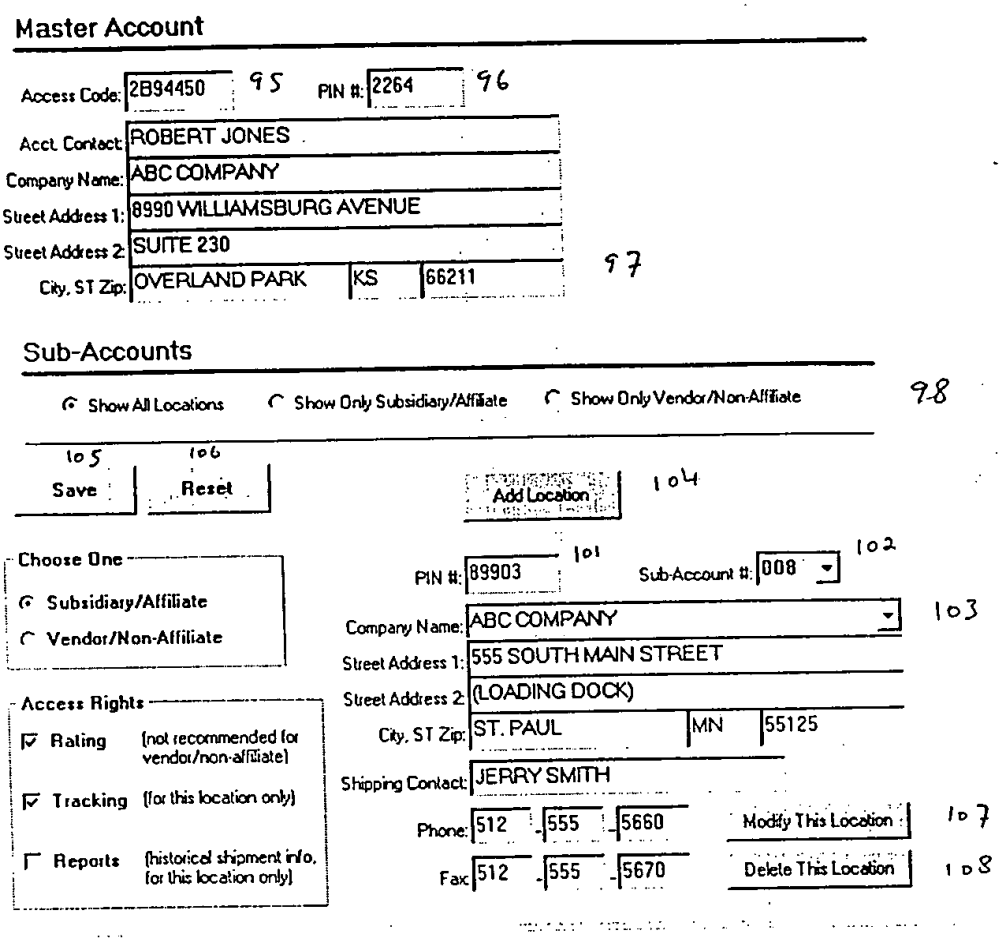
Master Account
Access Code: 2B94450
95
PIN #: 2264
96
Acct. Contact: ROBERT JONES
Company Name: ABC COMPANY
Street Address 1: 8990 WILLIAMSBURG AVENUE
Street Address 2: SUITE 230
City, ST Zip: OVERLAND PARK KS 66211
97
Sub-Accounts
Show All Locations
Show Only Subsidiary/Affiliate
Show Only Vendor/Non-Affiliate
98
105
Save
106
Reset
Add Location
104
Choose One
Subsidiary/Affiliate
Vendor/Non-Affiliate
99
PIN #: 89903
101
Sub-Account #: 008
102
Company Name: ABC COMPANY
103
Street Address 1: 555 SOUTH MAIN STREET
Street Address 2: (LOADING DOCK)
City, ST Zip: ST. PAUL MN 55125
Shipping Contact: JERRY SMITH
Access Rights
Rating (not recommended for vendor/non-affiliate)
Tracking (for this location only)
Reports (historical shipment info, for this location only)
100
98
Phone: 512 555 5660
Modify This Location
107
Fax: 512 555 5670
Delete This Location
108

FIGURE 16

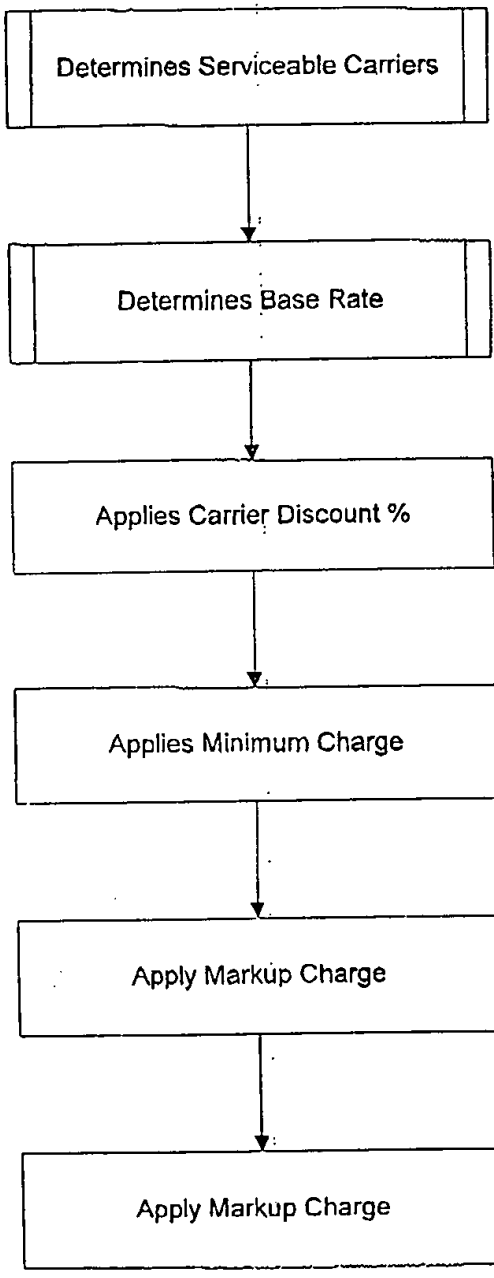
Determines Serviceable Carriers
109
Determines Base Rate
110
Applies Carrier Discount %
111
Applies Minimum Charge
112
Apply Markup Charge
113
Apply Markup Charge
114

FIGURE 17

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/557,822	04/25/2000	Timothy A. Barton	2799CIP	9903

7590 03/13/2002

Niro Scavone Haller & Niro
Suite 4600
181 West Madison Street
Chicago, IL 60602

EXAMINER	
NORMAN, MARC E	

ART UNIT	PAPER NUMBER
3744	

DATE MAILED: 03/13/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/557,822	BARTON, TIMOTHY A.	
	Examiner	Art Unit	
	Marc E. Norman	3744	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 November 2001* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3 and 6* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3 and 6* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *4/25/00* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Drawings

In view of the attached Notice of Draftsperson's Patent Drawing Review (PTO 948), and in view of revised USPTO policies and procedures regarding drawings, a proposed drawing correction or corrected drawings are required to reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-3 and 6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As per claim 1, it is unclear from the claim language exactly how the claimed invention reduces errors in freight services and billing. The system is actually more directed to reducing user errors, since that is where the mistakes occur. The actual billing and services are correct in that they reflect accurately what the user has chosen. Any discrepancies are a result of user errors not system errors. Accordingly, the preamble of the claim should be amended to reflect this distinction. Claims 2, 3, and 6 are rejected since they depend from rejected claim 1.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-3 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hunt et al. in view of Danford-Klein et al. (U.S. Patent 6,061,667) and Laverly.

As per claim 1, Hunt et al. teaches a server computer 83 (including system processor 90); a distributed network 80 connected to the server; a user computer 106 connected to the network; a database (see column 5, line 25) on the server containing shipping information (see column 3, lines 7-23). Hunt et al. does not teach programs or software for displaying at least one accessorial service and requiring the user to address the accessorial service offered and to accept or decline the accessorial service.

First, it is noted that the various types of accessorial services listed are all common and well known in the art, as described by Danford-Klein et al. (see Table 1, columns 17-19). Further, note that the system of claim 1 does not perform any of the accessorial services, it merely presents these as options to a customer that the customer must expressly accept of decline. Accordingly, the listed accessorial services are, in effect, nonfunctional descriptive material. As a result, the patentable distinction of the claim cannot rely on the type or title of service. The system would perform the same no matter what the title of the service was. The only difference a particular service type would yield would be what the customer would think or expect. This is not a structural distinction. Further, the reason why this is done, by itself, does not lend patentable weight. What matters is what is done, not why. Other motivations could

exist to do similar things for other services, e.g. to increase earnings for the merchant by making a customer specifically decline or accept an extended warranty or a maintenance plan or even accessories for the product purchased prior to checking out.

Second, the notion of requiring a user to accept or decline an option is well known in the art of computer programming. Laverly, for example, teaches a system requiring user agreement before proceeding, and explicitly requiring the user to accept or decline the agreement (see page 1, 5th paragraph). The fact that the applicant applies this feature within the context of accessorial services does not render it patentable over the prior art. It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply this accept/decline feature of Laverly to the system of Hunt et al. since the basic concept (i.e., requiring a user to accept or decline an agreement before proceeding) is well known in the art, and since applying this feature to the case of accessorial services is simply a specific application of requiring a user to accept or decline information. The accept/decline feature, even though applied by applicant to a different type of information, does not in itself render the claim patentable over the prior art. Also, the fact that it is being applied in order to reduce errors in freight services and billing does not lend patentable weight, since this simply pertains to why the feature is applied, not what is actually done.

As per claims 2 and 6, official notice is taken that addressing information individually or in a list are both common in the art of GUI programming and would have been obvious design choices are to how to present the agreement information.

As per claim 3, Laverly further teaches the user not being permitted to proceed until the agreement has been addressed (see page 1, 5th paragraph).

Remarks

The examiner notes that the above rejections are in contrast with the agreement reached between the Examiner and the Applicant during the interview conducted on 6 November 2001. However, further examination (particularly related to the issue of requiring a user to accept or decline on-line information) necessitated this rejection. In view of the previous agreement, the Examiner wishes to apologize to the Applicant for any inconvenience that this new rejection might cause.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Menzies teaches a system wherein a consumer chooses or declines an extended warranty.

Sonderegger (U.S. Patent 5,893,118); Peters et al. (U.S. Patent 5,893,098); Brandt et al. (U.S. Patent 5,892,905); Godin et al. (U.S. Patent 5,890,138); Koreeda (U.S. Patent 5,890,137); Weber (U.S. Patent 5,889,863); Vanechanos, Jr. (U.S. Patent 5,884,309); Cook (U.S. Patent 5,860,068); Cohen et al. (U.S. Patent 5,847,957); Montulli (U.S. Patent 5,826,242); Ogram (U.S. Patent 5,822,737); Teper et al. (U.S. Patent 5,815,665); Weber (U.S. Patent 5,787,400); Wesinger, Jr. et al. (U.S. Patent 5,778,367); Storey (U.S. Patent 5,774,870); Levine et al. (U.S. Patent 5,745,681); Chelliah et al. (U.S. Patent 5,710,887); Anderson et al. (U.S. Patent 5,706,442); Hogan (U.S. Patent 5,699,528); Shavit et al. (U.S. Patent 4,799,156) were all

01538711 01-89699

Laying down the law: Terms of use for World Wide Web sites

Lavery, Liam B

CPA Journal v67n11 PP: 86 Nov 1997 CODEN: CPAABS ISSN: 0732-8435
JRNL CODE: CPA
DOC TYPE: Journal article LANGUAGE: English LENGTH: 1 Pages
WORD COUNT: 770

ABSTRACT: More and more Web site publishers are attempting to set their own rules by imposing "terms and conditions" on people visiting their sites. Many webmasters are putting hypertext READ THIS notices on their home pages. These postings link to terms and conditions that purport to govern users of the web site. Tips for the web site publisher on how to effectively draft terms are provided.

TEXT: The World Wide Web is the wild frontier of commerce, and the law has not caught up with all the activity on the open range. Web sites offer users tremendous resources: database information, chat rooms, bulletin boards, free software, and entertainment. Universal rules for the use of these resources, however, do not yet exist. Without clear standards of behavior, users could start the chat room equivalent of a saloon fight, or make off like rustlers with a Web site's intellectual property.

More and more Web site publishers are attempting to set their own rules by imposing "terms and conditions" on people visiting their sites. Like a sheriff posting a warning at the edge of town, many Webmasters are putting hypertext READ THIS notices on their home pages. These postings link to terms and conditions that purport to govern users of the Web site. Even without a six-shooter and a tin star, the following tips will provide some ammunition for drafting terms that can keep the peace on a **Web** site:

Make the terms and conditions conspicuous. Merely giving clear notice of what behavior is expected will bring most users into line. A link to the terms of use, or the terms themselves, should be clearly and prominently labeled on the home page.

Require **user agreement** before proceeding. Common ways to get a **user** to **agree** to the terms of use include a button saying "I **Agree** " or a dialog box in which the **user must** type in his or her name. The **user** should also have the **explicit** option to **reject** the terms and leave the **Web** site, such as a button saying, "I Do Not **Agree** ." At minimum, the home page of the **Web** site should clearly state that proceeding to use the site constitutes **agreement** to the terms and conditions conspicuously shown to the **user** .

Make disclaimers regarding content. When appropriate, the terms of use should include disclaimers regarding the content of the site. If the **Web** site has an unmonitored bulletin board service available for users, the terms should specifically disclaim any responsibility for or review of user nosines on the bulletin board.

Include a license for content If the Web publisher wants to restrict copying, redistribution, or other use of the content on the Web site, the terms of use should include a license to that content.

Note appropriate guidelines for bulletin boards and chat. Terms of use should forbid the user from uploading anything that is obscene, infringes copyright, defames, or otherwise injures any person or entity. The terms and conditions should not imply, however, that the Web publisher will monitor the site, if that is not the case. In some situations, the user may be required to indemnify the Web publisher against any claim arising out of the user s breach of the site's guidelines.

Invite correction requests. The terms may extend an offer to remove-upon request-any infringing, defamatory, or other objectionable material, if the requesting user can adequately explain the nature of his or her objection.

Obtain a license from users. If the Web site publishes any user content on bulletin boards, chat rooms, or in any other form, each user should be required to grant a commensurate license to the Web publisher.

State a choice of law, jurisdiction, and venue. While the Web publisher may be located in Dodge City, a user may be located in Beijing. The terms and conditions should establish which jurisdiction's law will apply to their enforcement, and which jurisdiction's courts will have authority to judge any disputes.

Reserve the right to change and terminate. The terms and conditions should allow the Web publisher to change the terms from time to time by posting the changes on the Web site. Unless the user is paying for a defined period of access to a site, the Web publisher should reserve the right to terminate the agreement and the user's right to access the Web site under the terms and conditions, without notice.

While such terms and conditions may not actually keep all the bad guys off the Web site, they can at least allow the Web publisher to show it took reasonable steps to dissuade bad behavior. The terms may even provide the basis for a lawsuit against outlaws who have agreed to the terms prior to using the Web site. In any event, clear and conspicuous terms of use are an important step to finding "happy trails" on the Web.

Author Affiliation:

Liam IL Lavery is an attorney in the Seattle office of Preston Gates & Ellis LLP, with a practice focusing on intellectual property and online transactions.

GEOGRAPHIC NAMES: US

DESCRIPTORS: Web sites; Guidelines; Rules; Users; Self regulation
CLASSIFICATION CODES: 9000 (CN=Short Article); 9190 (CN=United States); 5250 (CN=Telecommunications systems); 9150 (CN=Guidelines)
?

US005835716A

United States Patent [19]

Hunt et al.

[11] Patent Number: 5,835,716

[45] Date of Patent: Nov. 10, 1998

Exhibit D

[54] METHOD AND SYSTEM FOR BROKERING EXCESS CARRIER CAPACITY

[75] Inventors: William M. Hunt, Shelton; Paul A. Levitsky, Bridgeport, both of Conn.

[73] Assignee: Pitney Bowes Inc., Stamford, Conn.

[21] Appl. No.: 572,916

[22] Filed: Dec. 15, 1995

[51] Int. Cl.[6] G06F 19/00

[52] U.S. Cl. 395/200.43; 395/200.32; 395/200.33; 395/200.36; 395/200.44; 705/5; 705/6; 705/406; 705/407

[58] Field of Search 395/200, 205, 395/206, 500, 200.32, 200.33, 200.36, 200.43, 200.44; 705/5, 6, 10, 37, 406, 407

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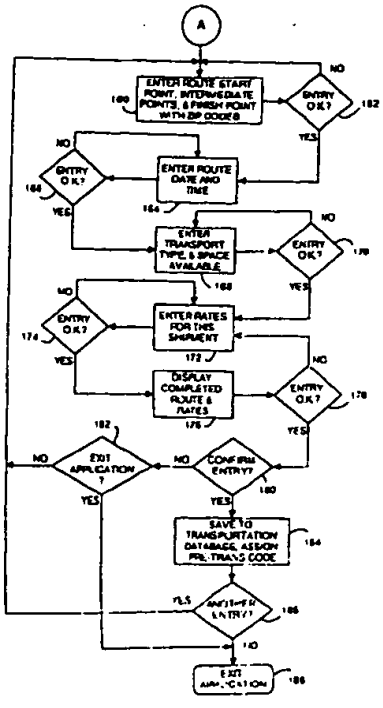
Primary Examiner—Parshotam S. Lall
Assistant Examiner—Bharat Barot
Attorney, Agent, or Firm—Melvin J. Scolnick; Charles Malandra; David Pitchenik

[57] ABSTRACT

The invention is a method for brokering carrier capacity. The method comprises a dual path; one path that allows entry into a data processing system of available carrier capacity which is comprised of a list of parameters which define that capacity, and the second path which allows access to that capacity. Each entry point to the system has data entry means for either entering carrier capacity or entering a request for available routes, or both. Available capacity entries are confirmed, saved in a transportation database, and assigned a pre-transaction code. Path two involves entering a request for available capacity by defining a requested route based upon a list of parameters. The system compares available capacity with the requested route to determine whether or not a match exists. The system operator selects an appropriate matched entry which must then be confirmed. Upon confirmation, selected matches are saved to a transaction database and assigned a transaction code. If no match is determined, then the requested route data is saved to a request database. A request database locator program is then activated for the purpose of querying the transportation database at pre-determined intervals to determine if a matching capacity has been subsequently entered. If a matching capacity has been subsequently entered, then a prompt is sent to the requesting site indicating that a match has been found and that confirmation is required; otherwise, the request database locator program will continue to query the transportation database until the routine is terminated.

21 Claims, 8 Drawing Sheets



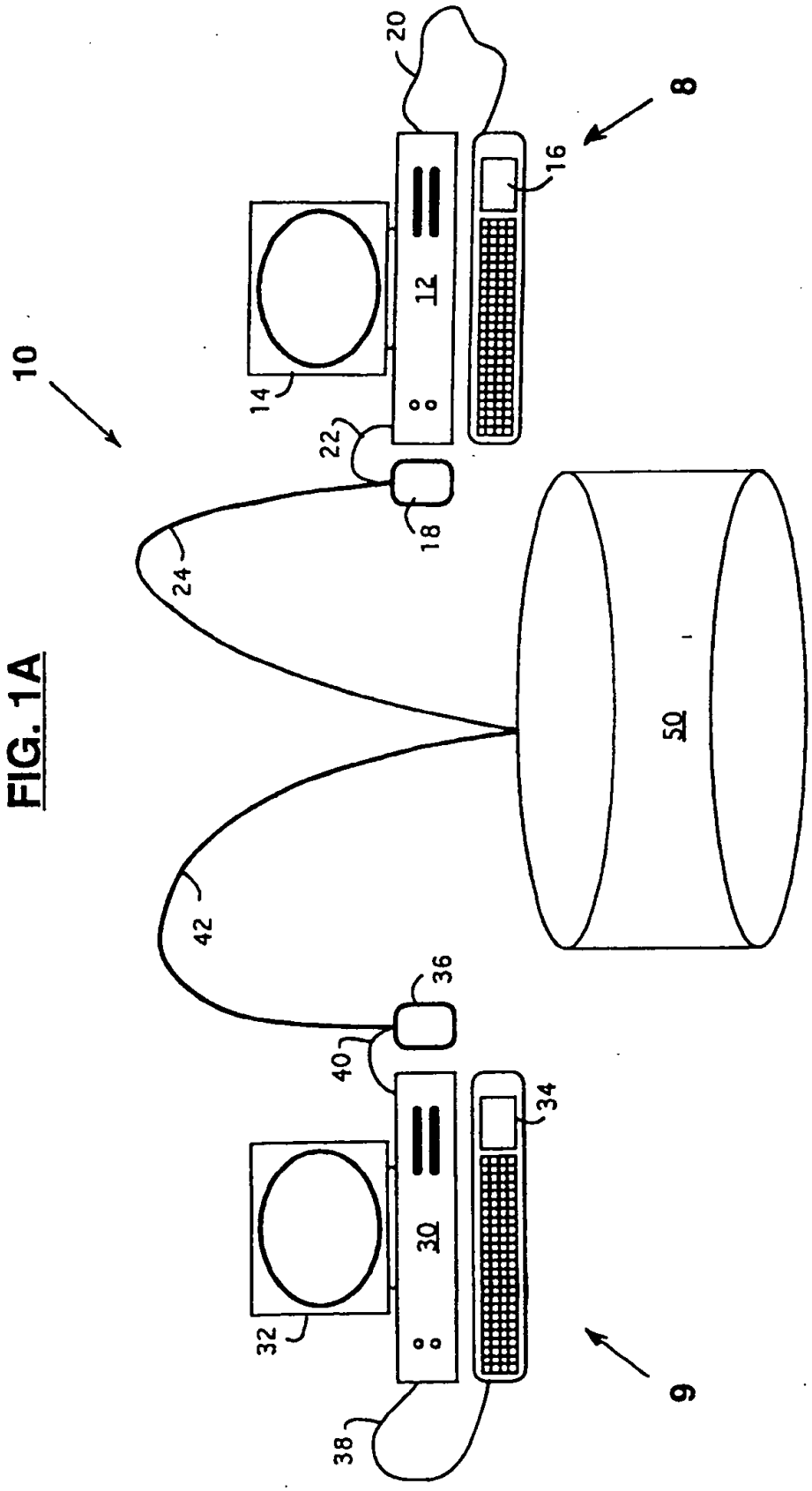


FIG. 1A

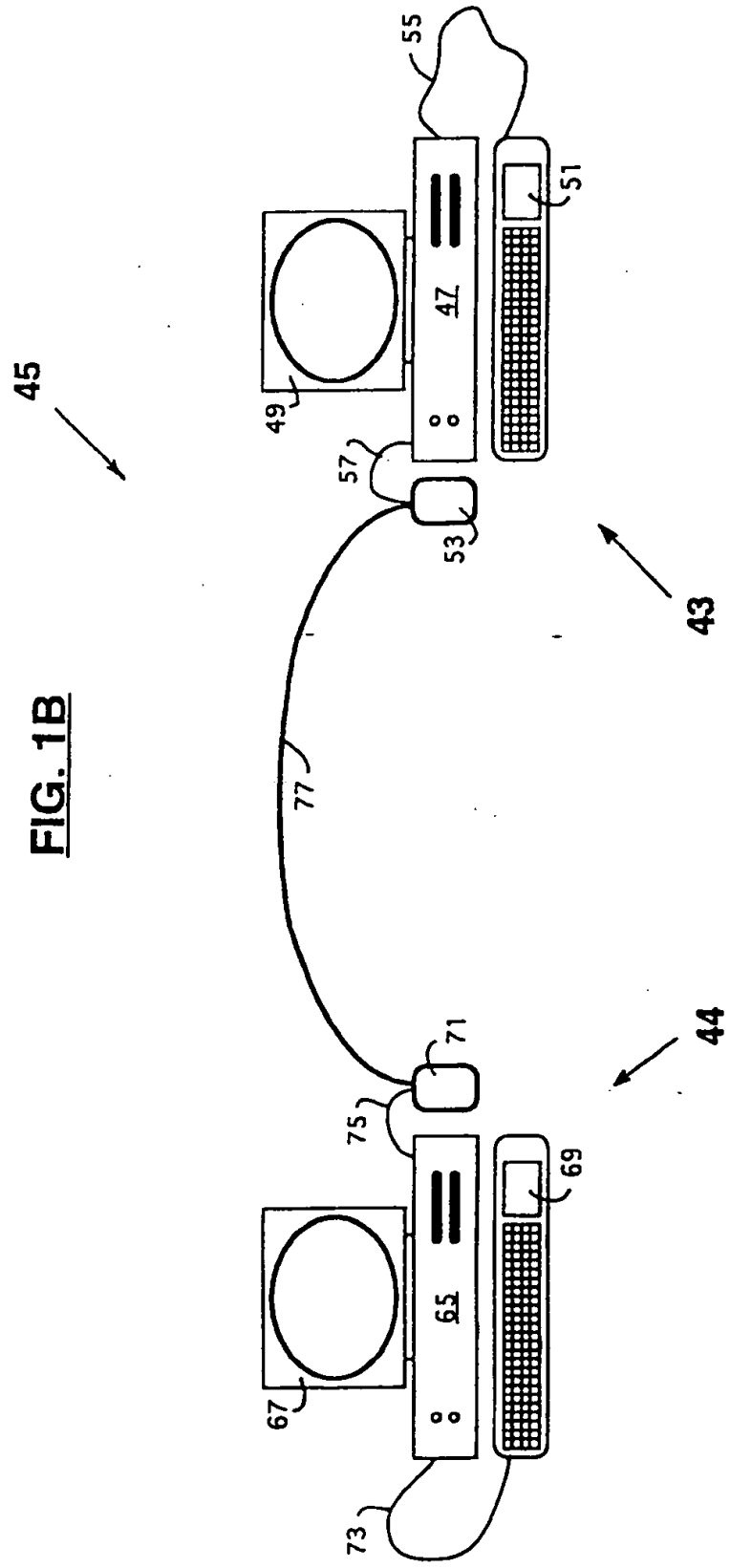


FIG. 1B

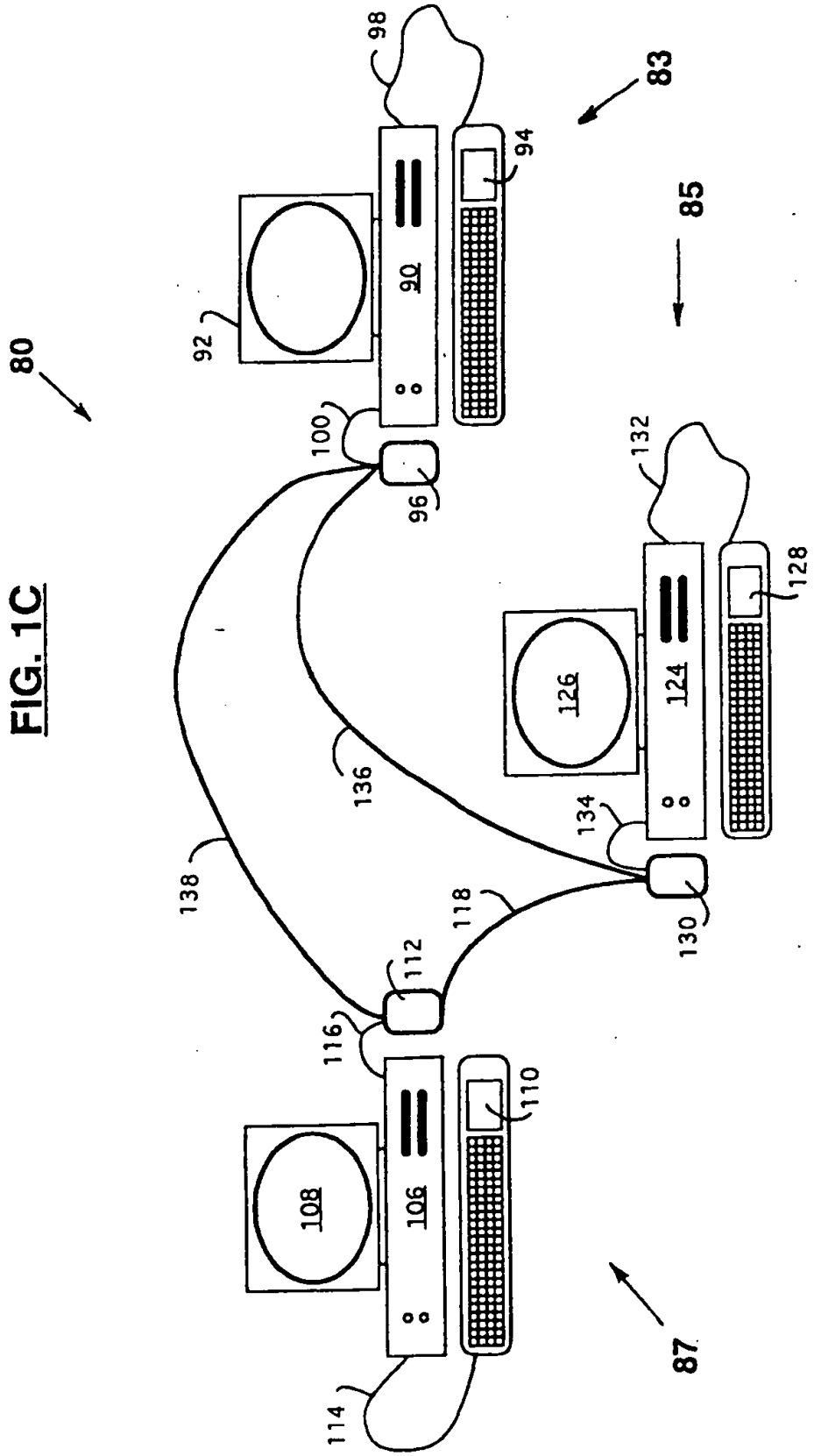

80
83
85
87
90
92
94
96
98
100
106
108
110
112
114
116
118
124
126
128
130
132
134
136
138

FIG. 1C

FIG. 2

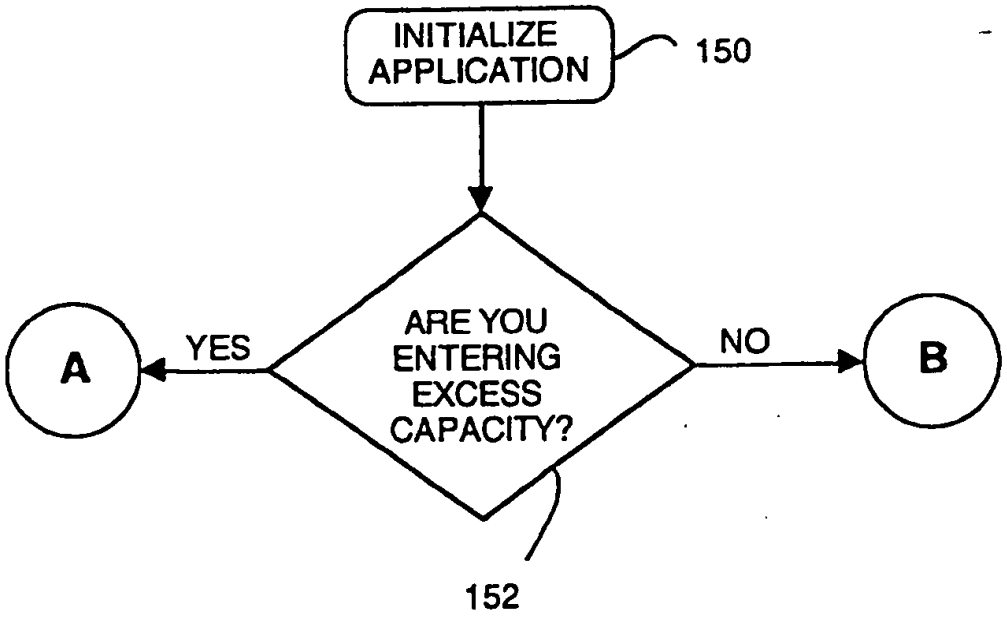

INITIALIZE APPLICATION
150
ARE YOU ENTERING EXCESS CAPACITY?
152
YES
A
NO
B

FIG. 3A

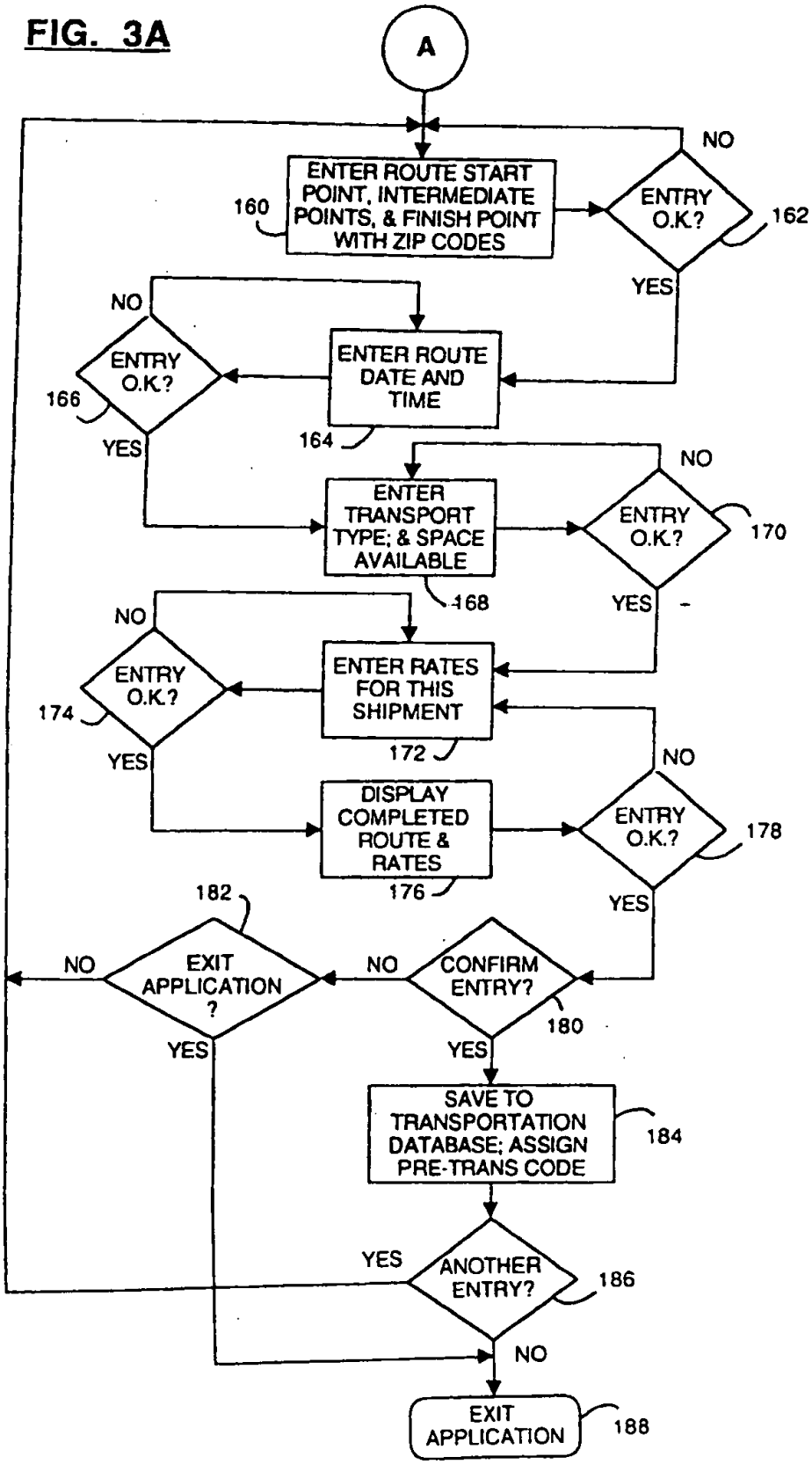

A
ENTER ROUTE START POINT, INTERMEDIATE POINTS, & FINISH POINT WITH ZIP CODES
160
ENTRY O.K?
162
NO
YES
ENTER ROUTE DATE AND TIME
164
ENTRY O.K?
166
NO
YES
ENTER TRANSPORT TYPE; & SPACE AVAILABLE
168
ENTRY O.K?
170
NO
YES
ENTER RATES FOR THIS SHIPMENT
172
ENTRY O.K?
174
NO
YES
DISPLAY COMPLETED ROUTE & RATES
176
ENTRY O.K?
178
NO
YES
CONFIRM ENTRY?
180
NO
YES
EXIT APPLICATION ?
182
NO
YES
SAVE TO TRANSPORTATION DATABASE; ASSIGN PRE-TRANS CODE
184
ANOTHER ENTRY?
186
YES
NO
EXIT APPLICATION
188

FIG. 3B

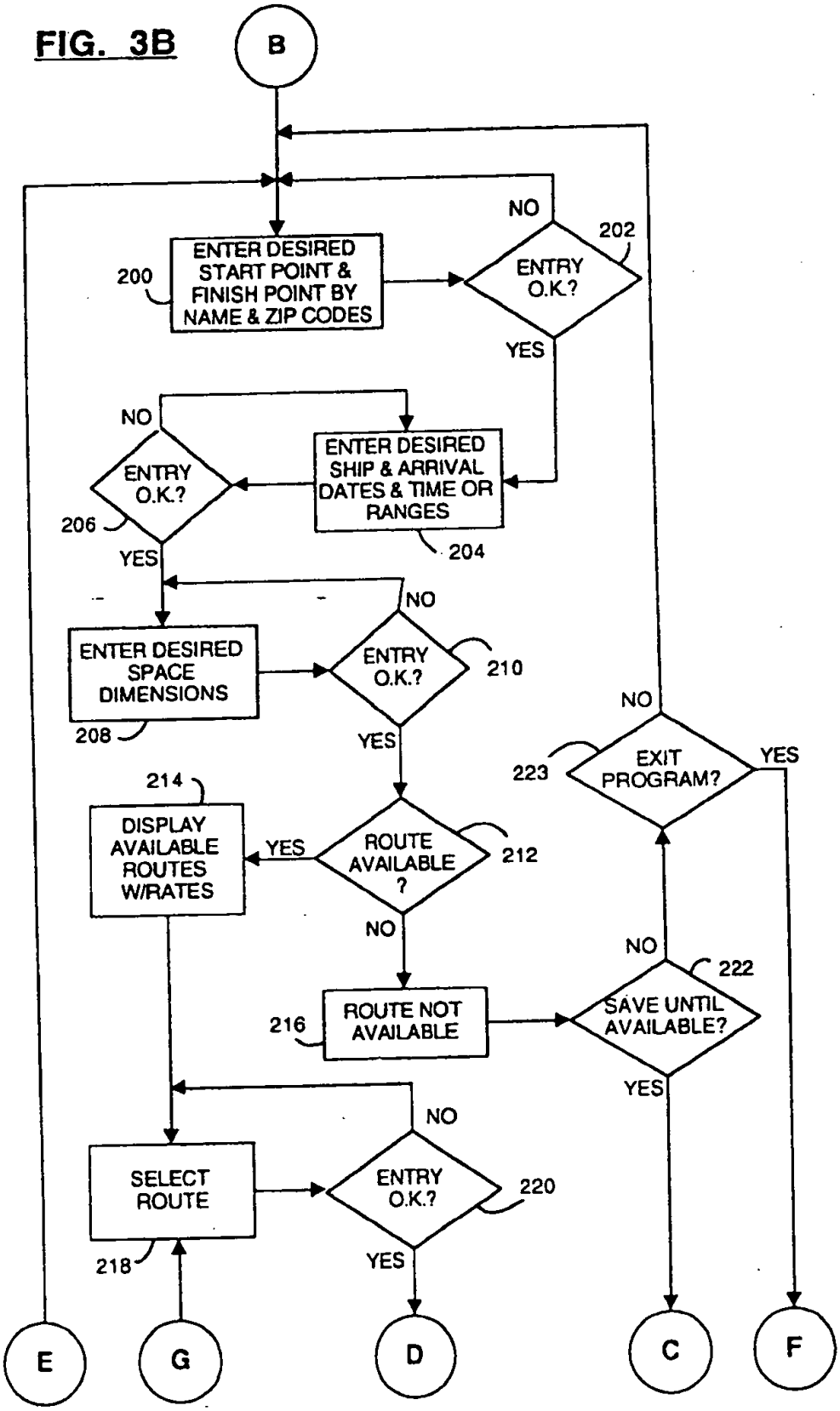

B
ENTER DESIRED START POINT & FINISH POINT BY NAME & ZIP CODES
200
ENTRY O.K.?
202
NO
YES
ENTER DESIRED SHIP & ARRIVAL DATES & TIME OR RANGES
204
ENTRY O.K.?
206
NO
YES
ENTER DESIRED SPACE DIMENSIONS
208
ENTRY O.K.?
210
NO
YES
DISPLAY AVAILABLE ROUTES W/RATES
214
ROUTE AVAILABLE ?
212
YES
NO
ROUTE NOT AVAILABLE
216
SAVE UNTIL AVAILABLE?
222
NO
YES
EXIT PROGRAM?
223
NO
YES
SELECT ROUTE
218
ENTRY O.K.?
220
NO
YES
E
G
D
C
F

FIG. 3C

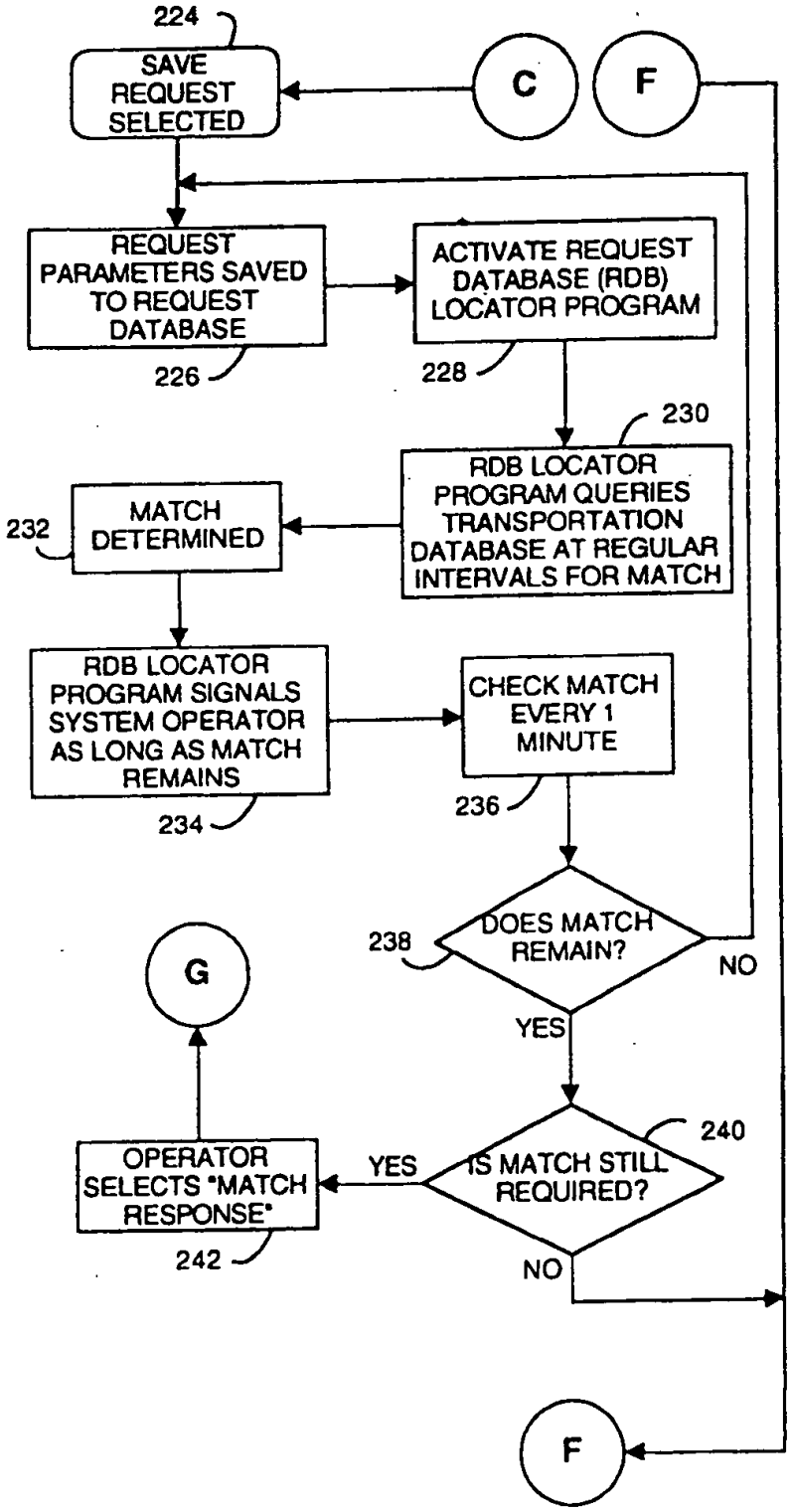
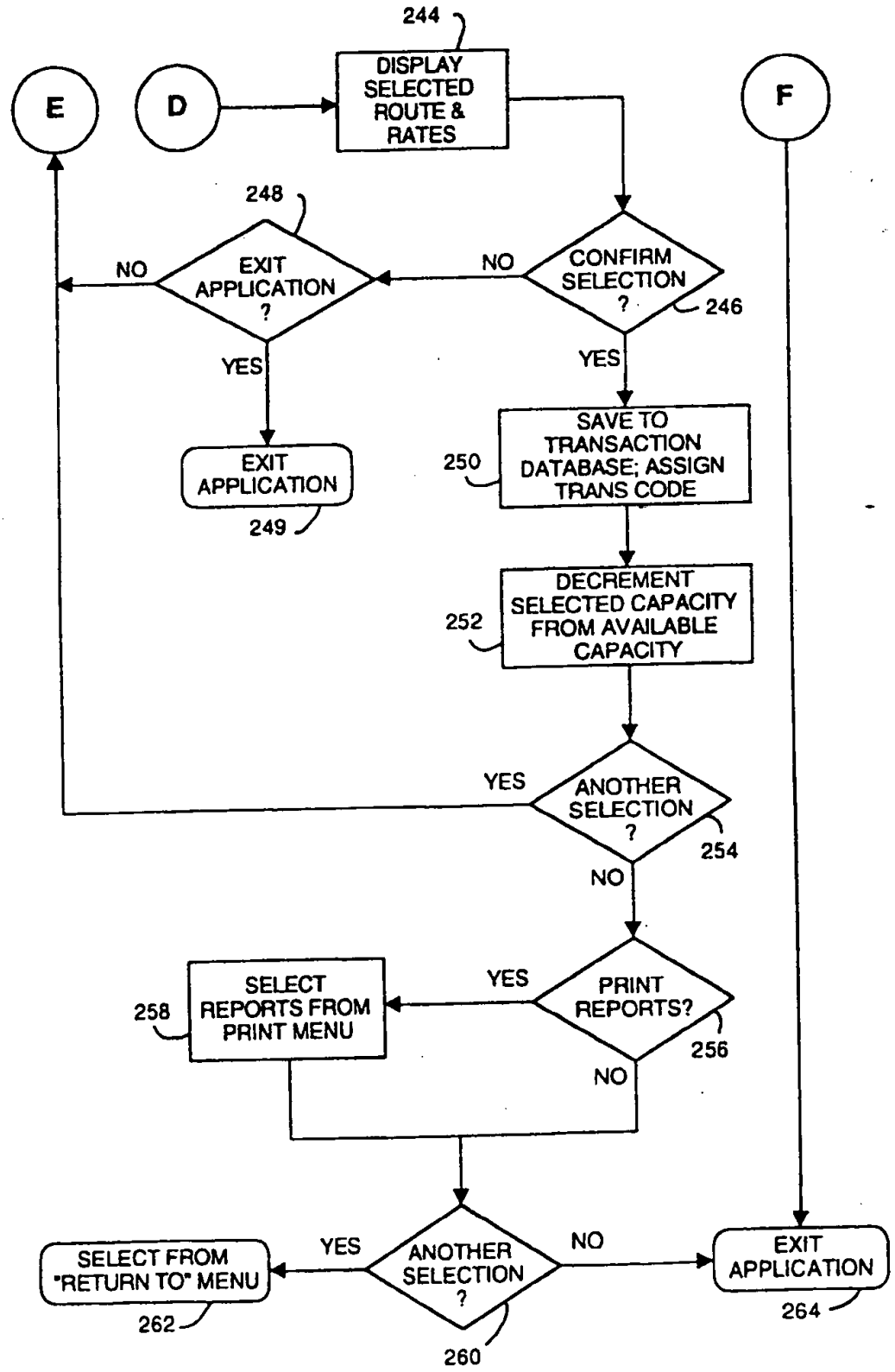

224
SAVE REQUEST SELECTED
C
F
REQUEST PARAMETERS SAVED TO REQUEST DATABASE
226
ACTIVATE REQUEST DATABASE (RDB) LOCATOR PROGRAM
228
230
RDB LOCATOR PROGRAM QUERIES TRANSPORTATION DATABASE AT REGULAR INTERVALS FOR MATCH
232
MATCH DETERMINED
RDB LOCATOR PROGRAM SIGNALS SYSTEM OPERATOR AS LONG AS MATCH REMAINS
234
CHECK MATCH EVERY 1 MINUTE
236
238
DOES MATCH REMAIN?
NO
YES
G
240
IS MATCH STILL REQUIRED?
YES
OPERATOR SELECTS "MATCH RESPONSE"
242
NO
F

FIG. 3D


E
D
244
DISPLAY SELECTED ROUTE & RATES
F
248
NO
EXIT APPLICATION ?
NO
CONFIRM SELECTION ?
246
YES
YES
EXIT APPLICATION
249
250
SAVE TO TRANSACTION DATABASE; ASSIGN TRANS CODE
252
DECREMENT SELECTED CAPACITY FROM AVAILABLE CAPACITY
YES
ANOTHER SELECTION ?
254
NO
258
SELECT REPORTS FROM PRINT MENU
YES
PRINT REPORTS?
256
NO
SELECT FROM "RETURN TO" MENU
262
YES
ANOTHER SELECTION ?
260
NO
EXIT APPLICATION
264

METHOD AND SYSTEM FOR BROKERING EXCESS CARRIER CAPACITY

RELATED APPLICATION

Reference is made to application Ser. No. 08/572,769 (Attorney Docket No. E-443), entitled METHOD AND SYSTEM FOR LISTING, BROKERING, AND EXCHANGING CARRIER CAPACITY, assigned to the assignee of this application and filed on Dec. 15, 1995, now U.S. Pat. No. 5,724,524.

BACKGROUND OF THE INVENTION

The ability of shippers to get parcels from the loading dock to the final destination in shorter time spans and at less cost has increased in recent years. The growth of the overnight carriers, and the consistency of the two and three day delivery carriers has created vast fleets of vehicles representing each of the many transportation modes.

The growth of shipping demand has fueled the drive for efficiencies that each of the carriers has been developing. Technological advances and better methods of doing business have in turn spurred greater demand for carrier services. The net result is that the volume of parcels being shipped has continued to spiral upward.

Systems and methods have been proposed to more efficiently handle the increased volume of parcels and the proliferation of carrier services that are available. Carriers have introduced systems and methods that are targeted to that carrier only. Shippers have looked for systems that provide them with a means to rate or service shop. The object of all of these systems has been to get a parcel on a vehicle for movement from point A to point B.

Carrier Management Systems such as that described in U.S. Pat. No. 5,040,132, SYSTEM FOR PREPARING SHIPPING DOCUMENTS, issued Aug. 13, 1991 to Schuricht et al., are well known to the art. One such system is the E900 Carrier Management System, developed and marketed by the assignee of the present application. The E900 generally includes as peripheral elements: a microprocessor; keyboard; monitor; platform scale; printer; and possibly a scanner. The E900 system automatically prepares documents for shipping articles to any desired number of different receivers by any selected carrier or mode.

The ability of carriers to respond to shipper needs is based on the carrier's capacity. Carrier capacity is the space that is available at any given time in the vehicle representing the carrier's mode of transport. For every shipment that leaves the dock of a shipper bound for a particular destination, a carrier makes available a mode of transportation. Each mode of transportation has its unique vehicle for transport: freight cars via rail; containers via ship; cubic inches via truck; etc.

More often than not, the vehicle utilized by the carrier has "excess capacity." That is, the maximum available space in the vehicle is not fully utilized for the movement of packages or parcels: at takeoff, the plane may have a few cubic feet of space available for shipping; at rollout, the freight train may have some available container space; or, at final pick-up, the truck may have some available space. Excess capacity, therefore, represents revenue or opportunity lost to the carrier.

While accounting for carrier space revenue/costs can be determined in detail by systems such as that described in U.S. Pat. No. 4,713,761, SYSTEM FOR CENTRALIZED PROCESSING OF ACCOUNTING AND PAYMENT FUNCTIONS, issued Dec. 15, 1987 to Sharpe et al., and in U.S. Pat. No. 5,222,018, also for a SYSTEM FOR CENTRALIZED PROCESSING OF ACCOUNTING AND PAYMENT FUNCTIONS, and issued Jun. 22, 1993 to Sharpe et al., these systems do not provide a means or method for determining or defining carrier space; these systems merely provide a revenue or cost value which can then be used for accounting purposes.

Combining carrier space definition together with accounting for that space was accomplished in part by the SABRE Travel Information Network and its successor ADS, both developed by American Airlines, Inc. of Dallas/Ft. Worth Airport, Tex. The above named systems, and their industry counterparts, allow travel agencies and carriers to identify space available by seat or by room, book reservations, and then produce accounting data so that revenue debits and credits can be booked automatically or manually for a variety of report types, and then eventually billed if necessary.

The present invention is an improvement over reservation systems such as SABRE or ADS because the ability to define excess carrier capacity by specific size is more flexible and more precise then the ability to define reserved or booked space as performed in the reservation systems. Additionally, requests for excess space are continually, and automatically, matched against available space until a match is found or until real-time makes a match prohibitive, as when the actual date and time (real-time) is later than the date and time that a particular space was available. Further, the system user has the ability to select the transport mode in determining request parameters; the ability of the reservation systems to provide mixed modal or alternative transport mode selection is limited at best.

Therefore, an object of the present invention is to provide additional revenue or additional cost savings by creating a method of notifying shippers that a carrier has excess capacity. In order to interest shippers in utilizing the available space, carriers can offer the space at a discount or at no-charge, the benefit obtained from "no-charge" space being the goodwill associated with such offerings. The latter could be reserved for special customers who achieve certain efficiencies during a qualifying period. The promotional opportunities are extensive.

A further object of the present invention is to provide a method that can be utilized internally by a company to maximize its own efficiency. Many companies utilize internal fleets of trucks or other vehicles to move product, inventory, or parcels within the company or within a tightly controlled network. The present invention would provide an easy method of locating available carrier capacity within the internal system so that time schedules could be more easily adhered to and the cost of utilizing outside carriers could be reduced.

SUMMARY OF THE INVENTION

According to the invention, the object is achieved and the disadvantages of the prior art are overcome by a method for brokering carrier capacity that provides flexibility to the users as well as the ability to be used within the internal environment of one carrier or within a network of several carriers. Brokering, as used herein, refers to a system that acts as an intermediary between the shipper/user of carrier space and the carrier that has listed the space.

The method comprises a number of steps. These steps occur over a dual path; one path that allows entry of available carrier capacity, and the second path which allows

access to that available capacity. The method employs a data processing system, with a real-time clock, supporting an application which embodies the method. There are at least two entry points into the system. Each entry point has a real time clock as well as data entry means for entering either carrier capacity to the system or entering a request for available routes into the system, or both.

Path one involves determining that carrier capacity is to be entered into the application, and then actually making such an entry. Entry data is comprised of a list of parameters which may include: amount of space available, destination; dates and times; rates; and mode of transport. Mode of transport would include, at least: air; ground; ship; rail; and/or mixed modal. Mixed modal is defined as the use of two or more modes of transport within a single route. The entry is then confirmed, saved in a transportation database, and assigned a pre-transaction code.

Path two involves entering a request for available capacity into the system by defining a requested route. The requested route is defined by request data which is comprised of a list of parameters which may include: amount of space required, destination; dates and times; rates; and mode of transport. The fewer parameters that are entered, the greater the scope of the search.

The system utilizes data processing means for determining whether a match can be found between the request for available capacity and what has actually been entered into the transportation database. The system operator making the request for carrier capacity is provided with means for displaying the request made as well as displaying the located matched entries; the display means being preferably a monitor or a printer, or both, operatively connected to the data processing system. The operator can then select an appropriate matched entry from among those displayed. The selection must then be confirmed. Upon confirmation, the selected matched entry is saved to a transaction database and assigned a transaction code. The assignment of a transaction code can then be the initiating step in preparing a bill for services or generating a transaction report.

Within path two of the method, there exists the possibility that no match will be found between what is available and what has been requested. If a null response is received when the requested route is compared with the listing of available capacity entered into the transportation database, then the requested route data is saved to a request database.

A request database locator program is activated within the data processing system for the purpose of querying the transportation database at pre-determined time intervals to determine if a matching route selection has been entered into the transportation database subsequent to the initial request. If a matching route selection has been entered into the transportation database, then a prompt is sent to a display device at the location where the route request was made; the prompt indicating that a match has been found and that the system operator should enter the application to confirm the match.

If, however, a matching route selection has not been entered into the transportation database, then the request database locator program will continue to query the transportation database at pre-determined time intervals until either the date and time of the requested route has exceeded the date and time on the real time clock of the data processing system, or until the query is terminated by the system operator.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1A is a block diagram of an embodiment of a system having a centralized database that can utilize the subject method as disclosed.

FIG. 1B is a block diagram of an alternative embodiment of a system having point to point communication that can utilize the subject method as disclosed.

FIG. 1C is a block diagram of an alternative embodiment of a system having multi-node interface that can utilize the subject method as disclosed.

FIG. 2 is a flow chart of the initialization and entry into the two main paths of the method flow.

FIG. 3A is a flowchart of the method path whereby excess carrier capacity may be entered into the system for use.

FIG. 3B is a flowchart of the method path whereby a system user can reserve space for use that has been entered into the system by a carrier.

FIG. 3C is a continuation of the flowchart of the method path of FIG. 3B whereby a system user can reserve space for use that has been entered into the system by a carrier.

FIG. 3D is a continuation of the flowchart of the method path of FIG. 3C whereby a system user can reserve space for use that has been entered into the system by a carrier.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Turning to FIG. 1A, there is depicted an embodiment of a system that employs the invention method.

System **10** is comprised of subsystems **8** and **9**. Subsystem **8** represents an input/output point at a carrier or shipper site that is porting data to centralized database **50** which can be administered by the carrier, shipper, or a third party. Subsystem **8** further comprises: microprocessor **12**, for processing data entered by the system operator, has a real-time clock used for determining when the actual date and time has passed, or is about to pass, the time of performance for the carrier space listed or requested; microprocessor **12** is operatively connected to monitor **14** where the system operator can view entries made to the system, matches available, or receive notification of a match; keyboard **16**, which is used to make data entries to the system, is connected to microprocessor **12** by interface cable **20**; modem **18**, which can transmit or receive data entries or records to or from database **50**, is connected to microprocessor **12** by interface cable **22**; and, modem **18** which is further connected to database **50** by interface cable **24**.

Subsystem **9** represents an input/output point at a carrier or shipper site that is porting data to centralized database **50** which can be administered by the carrier, shipper, or a third party. Subsystem **9** further comprises: microprocessor **30** for processing data entered by the system operator; microprocessor **30** is operatively connected to monitor **32** where the system operator can view entries made to the system, view matches available, or receive notification of a match; keyboard **34**, which is used to make data entries to the system, is connected to microprocessor **30** by interface cable **38**; modem **36**, which can transmit or receive data entries or records to or from database **50**, is connected to microprocessor **30** by interface cable **40**; and, modem **36** which is further connected to database **50** by interface cable **42**.

In an alternative embodiment, modem **18** and/or modem **36** can be connected to database **50** by telephone lines which may further comprise: radio frequency (RF), multichannel (MUX), satellite, microwave, or similar links.

Turning to FIG. 1B, there is depicted an embodiment of a system that might employ the invention method. System **45** is comprised of subsystems **43** and **44** and represents a direct point to point system of a type that might be used in an intracompany environment where the database does not

have to be separated out from the input/output points. It should be noted that this configuration could be altered to accommodate more than two subsystems; an example is found in FIG. 1C.

Subsystem **43** further comprises: microprocessor **47** operatively connected to monitor **49** for viewing record entries or other data; keyboard **51**, for entering data to the system, is connected to microprocessor **47** by interface cable **55**; modem **53**, for transmitting data, is connected to microprocessor **47** by interface cable **57**; and, modem **53** further connected to modem **71** by interface cable **77**. Subsystem **44** further comprises: microprocessor **65** operatively connected to monitor **67**; keyboard **69** connected to microprocessor **65** by interface cable **73**; modem **71** connected to microprocessor **65** by interface cable **75**; and, modem **71** further connected to modem **53** by interface cable **77**.

In an alternative embodiment, modem **53** and/or modem **71** can be connected to each other by telephone lines which may further comprise: radio frequency (RF), multichannel (MUX), satellite, microwave, or similar links.

Turning to FIG. 1C, there is depicted an embodiment of a system that might employ the invention method. System **80** is comprised of subsystems **83**, **85**, and **87** and represents a network of direct point to point systems of a type that might be used in an intracompany environment, or in a shared network environment. The database could reside in any of the three subsystems **83**, **85**, or **87** or could be located in each of the subsystems when in an environment where the database does not have to be separated out from the input/output points. It should be noted that this configuration does not have to be limited to only three subsystems; additional subsystems could be added.

Subsystem **83** further comprises: microprocessor **90**, for processing system data, operatively connected to monitor **92** for displaying data; keyboard **94**, for entering data, connected to microprocessor **90** by interface cable **98**; modem **96**, for communicating data, connected to microprocessor **90** by interface cable **100**; modem **96** connected to modem **112** by interface cable **138**; and, modem **96** further connected to modem **130** by interface cable **136**.

Subsystem **85** further comprises: microprocessor **124**, for processing data, operatively connected to monitor **126** for displaying data; keyboard **128**, for entering data, connected to microprocessor **124** by interface cable **132**; modem **130**, for communicating data, connected to microprocessor **124** by interface cable **134**; modem **130** connected to modem **112** by interface cable **118**; and, modem **130** further connected to modem **96** by interface cable **136**. Additionally, subsystem **87** further comprises: microprocessor **106** operatively connected to monitor **108**; keyboard **110** connected to microprocessor **106** by interface cable **114**; modem **112** connected to microprocessor **106** by interface cable **116**; modem **112** connected to modem **130** by interface cable **118**; and, modem **112** further connected to modem **96** by interface cable **138**.

In an alternative embodiment, modem **96** and/or modem **112** and/or modem **130** can be connected to each other by telephone lines which may further comprise: radio frequency (RF), multichannel (MUX), satellite, microwave, or similar links.

Turning to FIG. **2**, there is depicted a flowchart of the entry into the system application. The application is initialized at step **150** and then advances to step **152**. At step **152**, the system queries the system operator as to whether or not the system operator is entering excess carrier capacity.

If the response to the query at step **152** is "YES," then the method advances along path A to step **160** which is shown in FIG. 3A. If, however, the response to the query at step **152** is "NO," then the method advances along path B to step **200** which is shown in FIG. 3B.

Turning to FIG. 3A, path A enters at step **160** where the route start point and finish point are entered. It is at this step that intermediate points, if any, can be identified. The preferred method of entry is by using start and destination postal codes (zip code in the United States); these are well known in the art. The degree of accuracy required in establishing pick-up and delivery points can be adjusted according to the type of postal code accepted by the system.

For instance, in the United States, the elements of a postal zip code consist of four parts; these are: (i) the "zip code," which consists of 5 digits and refers to geographic area or zone; (ii) the "Zip+4" further breaks down a zip code region into smaller sub-regions, this code consists of four digits added to the base zip code; (iii) "delivery point digits" which consist of two additional digits that further break down a Zip+4 so that the carrier can more accurately pin point an exact location; and, (iv) a check sum digit; the check sum digit would not be required in the present invention. In the mailing services environment, the delivery point digits are abstracted from the street line of the address using the approved algorithm of the postal service; either the U.S.P.S. algorithm or a proprietary algorithm could be used.

After entry of the route start point and finish point at step **160**, the method advances to step **162** where the method queries as to whether or not the entry at step **160** was correct. If the response to the query is "NO," then the method returns to path A for re-entry to step **160**. If, however, the response to the query at step **162** is "YES," then the method advances to step **164** where the start and end dates and times of the route are entered into the system.

After entry of the route start and end dates and times at step **164**, the method advances to step **166** where the method queries as to whether or not the entry at step **164** was correct. If the response to the query is "NO," then the method returns to step **164** for re-entry of the appropriate data. If, however, the response to the query at step **166** is "YES," then the method advances to step **168** where the mode of transport (i.e., sea, truck, rail, air, mixed modal) and the amount or type of space available are entered into the system.

After entry of the mode of transport and the amount of available space at step **168**, the method advances to step **170** where the method queries as to whether or not the entry at step **168** was correct. If the response to the query is "NO," then the method returns to step **168** for re-entry of the appropriate data. If, however, the response to the query at step **170** is "YES," then the method advances to step **172** where the rates and applicable charges are entered into the system.

After entry of the rates at step **172**, the method advances to step **174** where the method queries as to whether or not the entry at step **172** was correct. If the response to the query is "NO," then the method returns to step **172** for re-entry of the appropriate data. If, however, the response to the query at step **174** is "YES," then the method advances to step **176** where the entered routes and their corresponding rates are displayed back to the system operator on monitor **14** or alternatively on a printer, or both on a monitor and a printer.

After display of the routes and rates at step **176**, the method advances to step **178** where the method queries as to whether or not the entry displayed at step **176** was correct. If the response to the query is "NO," then the method returns to step **172** for re-entry of the appropriate data. If, however, the response to the query at step **178** is "YES," then the

Step & confirm steps safeguards

method advances to a query at step **180**. At step **180**, the method queries as to whether or not to confirm the entry displayed at step **176**. If the response to the query is "NO," then the method advances to step **182** where the method further queries as to whether or not the application is to be exited. If the response to the query at step **182** is "NO," then the method returns to path A to re-enter at step **160**. If, however, the response to the query at step **182** is "YES," then the method advances to step **188** where the application is exited. Returning to step **180**, if the response to the query is "YES," then at step **184** the entered route and appropriate rates are saved to the transportation database as available carrier capacity and are assigned a pre-transaction code.

From step **184**, the method advances to a query at step **186**. At step **186**, the method queries as to whether or not another entry is required. If the response to the query is "YES," then the method advances to path A and re-enters at step **160**. If, however, the response to the query at step **186** is "NO," then the method advances to step **188** and exits the application.

The pre-transaction code serves the purpose of identifying the available carrier capacity which has been placed in the transportation database at step **184**; the code, and a description of the carrier capacity, will be displayed to a system operator when selection of available space is required, and can be further used for identification in preparing reports and in the records necessary for regulated industries or transactions. Neither a discussion nor description of the reports required by the carrier industry or regulating agencies are advanced within this application as they are not required for an understanding of the subject invention.

Turning to FIG. **3B**, the flow of path B as it enters from FIG. **2** can be seen. Path B enters at step **200** where the start point and end point of a requested route (requested capacity) are entered. Additionally, from FIG. **3D**, path E enters at step **200** as well.

At step **200**, the start and end points for the requested route are entered by: street; city; zone; state/province/prefecture; country; and/or postal code. From step **200**, the method advances to a query at step **202** which asks if the entry made at step **200** is correct. If the response to the query is "NO," then the method returns to path B and re-enters at step **200**. If, however, the response to the query at step **202** is "YES," then the method advances to step **204**.

At step **204**, the ship date and time and the delivery date and time for the route are entered; it is possible, at this point, to enter ranges for date and time so as to broaden the database search for a match. From step **204**, the system advances to a query at step **206**. The query at step **206** asks whether or nor the entry made at step **204** is correct. If the response to the query is "NO," then the method returns to **204** where the proper data can be entered. If, however, the response to the query at step **206** is "YES," then the method advances to step **208**.

At step **204**, the desired space dimensions for the route are entered, and then the method advances to a query at step **210**. The query at step **210** asks whether or nor the entry made at step **208** is correct. If the response to the query is "NO," then the method returns to **208** where the proper data can be entered. If, however, the response to the query at step **210** is "YES," then the method advances to step **212**.

At step **212**, the system queries itself as to whether or not the requested route entered is available. To accomplish the query, the system takes the parameters entered at steps **200**, **204**, and **208** and compares them to the parameters stored in the transportation database as carrier capacity. If the response to the query is "YES," then the method advances to step **214** where the matching route, or routes, is/are displayed. If, however, the response to the query at step **212** is "NO," then the system advances to step **216** and displays "Route Not Available."

From step **216** the method advances to step **222** and queries as to whether or not the requested carrier capacity parameters should be saved until carrier capacity is made available or until the real time clock of the system has advanced beyond the requested date and time parameters. If the response to the query at step **222** is "NO," then the method advances to step **223** and queries as to whether or not to exit the program. If the response to the query at step **223** is "NO," then the method advances to path B where it re-enters at step **200**. If, however, the response to the query at step **223** is "YES," then the method advances along path F to FIG. **3D** where it enters at step **256**. In looking back to step **222**, if the response to the query is "YES," then the method advances along path C to FIG. **3C** where it enters at step **224**.

Returning to step **214**, from the displayed list of available routes, the system operator can scroll up or down the list and select an appropriate route by highlighting the entry and entering the selection at step **218**. Also entering at step **218** is path G which originated at step **242** of FIG. **3C**. From step **218**, the method advances to a query at step **220** which asks whether or not the entry selected at step **218** was the correct entry. If the response to the query is "YES," then the method advances along path D to FIG. **3D** where it enters at step **244**. If the response to the query at step **220** is "NO," then the method returns to enter the flow just after step **214** and prior to step **218**.

Turning to FIG. **3C**, the method enters at step **224** from path C which had originated at step **222**.

At step **224**, it is determined that the carrier capacity request be saved and at step **226** the request parameters are saved to the request database. From step **226**, the method advances to step **228** and activates the request database (RDB) locator program.

The purpose of the RDB locator program is to query the transportation database at regular intervals that can be programmed at system set-up so as to locate available carrier capacity that may be entered in the system after the initial capacity request is made. The RDB locator program takes the carrier capacity request parameters and asks the transportation database if a suitable match has been entered. The RDB locator program will continue to query the transportation database until it is requested through a pull down menu that the RDB locator program terminate the query, or when the system's real time clock has exceeded the time and date parameters of the carrier capacity request.

Once the RDB locator program is activated at step **228**, the method advances to step **230** and begins querying the transportation database at regular intervals for a possible match. If a match is found, the method advances to step **232** where the match is verified; the method then advances to step **234** where the RDB locator program signals the system operator that a match has been located. The RDB locator program will continue to signal the system operator as long as the match remains or until the system operator either selects or discards the match.

From step **234**, the method advances to step **236** where the method continues to check at regular intervals that the match still exists. The purpose of the continual match check is to recognize that other carrier capacity requests may be entering the system from other entry points and, that the system

operator may not be able to respond to the match notification in a timely manner. From step **236**, the method advances to step **238** and queries as to whether or not the match still remains. If the response to the query is "NO," then the method re-enters at step **226**; otherwise, if the response to the query is "YES," then the method advances to step **240**.

Step **240** queries as to whether or not a match is still required. If the response to the query is "NO," then the method advances to path F which enters at step **254** in FIG. **3D**. If, however, the response to the query at step **240** is "YES," then the method advances to step **242** where the system operator selects the match. After selection of the offered match, the method advances along path G to re-enter at step **212** in FIG. **3B**.

Turning to FIG. **3D**, the method enters at step **244** from path D which had originated at step **214** and, at step **256** from path F which had originated at step **220**.

From path D, the method advances to step **244** where the selected route and rates are displayed. The method then advances to step **246** and queries as to whether or not the entry displayed at step **244** is to be confirmed. If the response to the query is "NO," then the method advances to a query at step **248** which asks if the application is to be exited. If the response to the query at step **248** is "NO," then the method advances along path E to re-enter at step **200** in FIG. **3B**. If, however, the response to the query at step **248** is "YES," then the method advances to step **249** and exits the application.

Returning to step **246**, if the response to the query is "YES," then the method advances to step **250** where the selection is saved to the transaction database and assigned a transaction code. The transaction database will serve as the data base from which a number of different reports and documentation can be generated for the appropriate carrier needs and regulatory authorities. In saving to the transaction database, at step **252**, the system decrements the selected capacity from the available capacity stored in the transportation database. From step **252**, the method advances to step **254**.

At step **254**, the method queries as to whether or not another selection is required. If the response to the query is "YES," then the method advances along path E to enter at step **200** in FIG. **3B**. It, however, the response to the query at step **254** is "NO," then the method advances to step **256** and queries as to whether or not the system operator wishes to print any of the reports that are available. If the response to the query is "NO," then the method advances to a query at step **260**. If, however, the response to the query at step **256** is "YES," then the method advances to step **258** where the system operator can select one or more reports to be printed. From step **258** the method advances to the query at step **260**.

The method queries at step **260** as to whether or not the system operator wants to select another activity. If the response to the query is "NO," then the method advances to step **264** and exits the application. If, however, the response to the query at step **260** is "YES," then the method advances to step **262** where the operator can select a next activity from a "RETURN TO" menu. The "RETURN TO" menu allows the system operator to return to step **152** of the method, or to some other point of the method as required.

Once the carrier space has been accounted for through sale or trade, a manifest or similar report can be generated and transmitted to the operator of the transport medium on which the carrier space exists. In so doing, the transport medium operator is provided with an up-to-date accounting of all space for a particular route. The manifest or similar report can be generated at step **256**, or alternatively could be an additional activity to be selected at step **262**.

As can be appreciated by those skilled in the art, a number of variations of the subject invention are possible. These variations include, but are not limited to: the ability of the system to print reports or generate billings for services at selected steps within the application; the use of a pop-up window instead of a pull-down menu when making decisions within the RDB locator program; the nature and scope of each of the hardware components of the data processing system; the ability of the system to handle more than one carrier and the carriers' respective rates; the ability to scan data into the system; the length of time intervals employed at steps **230** and **236**; and, the extent to which data can be downloaded from the system to either a transfer media or to another data processing system.

What is claimed is:

1. A method for brokering carrier capacity comprising the steps of:

(a) entering carrier capacity data from a first node into a transportation database in a data processing system, said capacity data identifying carrier capacity available by specific units of volume for a particular route at a particular time and identifying the mode of transportation;

(b) entering a request for a route into said data processing system at a second node by defining said requested route;

(c) comparing said requested route with said carrier capacity data entered into said data processing system to determine whether or not a route match exists;

(d) displaying a list of matching routes to a system operator;

(e) selecting a matching route from said list of matching routes;

(f) saving said matching route selection to a transaction database;

(g) assigning a transaction code to said saved matching route selection; and

(h) decrementing availability of said matching route selection from said data in said transportation database.

2. The method of claim 1, wherein said data processing system utilizes a real time clock whereby said system can determine when carrier capacity listed in said data processing system can no longer be accessed because of a time/date threshold.

3. The method of claim 1, wherein a transaction code is assigned to said matching route selection.

4. The method of claim 2, wherein said entering capacity data step further comprises the steps of:

(a) confirming said entry;

(b) saving said entry in said transportation database; and

(c) assigning a pre-transaction code to said entry.

5. The method of claim 2, wherein said entering a request step further comprises the steps of:

(a) defining a location start point of said route and a location end point of said route;

(b) defining a desired date and time for shipping and arrival corresponding to said route start point and said route end point;

(c) choosing a transportation medium; and

(d) receiving a confirmation that said requested route has been entered into said data processing system.

6. The method of claim 2, wherein if a null response is received when said requested route is compared with said

list of routes entered into said transportation database, then said requested route data is saved to a request database.

7. The method of claim 6, wherein a request database locator program is activated within said data processing system for the purpose of querying said transportation database at pre-determined time intervals to determine if a matching route selection has been entered into said transportation database.

8. The method of claim 7, wherein if said matching route selection has been entered into said transportation database then a prompt is sent to a display device where said route request was made; said prompt indicating that a match has been found and that said system operator should enter said application to confirm said match.

9. The method of claim 8, wherein if said matching route selection has not been entered into said transportation database then said request database locator program will continue to query said transportation database at said pre-determined time intervals until: (i) said date and time of said requested route has exceeded a date and time on said real time clock of said data processing system, or (ii) said query is terminated by said system operator.

10. The method of claim 8, wherein said display is a monitor or a printer operatively connected to said data processing system.

11. The method of claim 2, wherein said data processing system is comprised of a plurality of entry points into said system and each entry point has data entry means for entering either carrier capacity to said system or entering a request for available routes into said system, or both.

12. The method of claim 3, wherein a bill for services, a transaction report, or both, is prepared in respect of said transaction code.

13. The method of claim 2, wherein said entering a request step further comprises the step of defining a location start point of said route and a location end point of said route by causing said start point and said end point to be entered into said data processing means by scanning said start point and said end point into said data processing means with a scanner or optical character reader from a label of a parcel to be shipped or from a printed media.

14. The method of claim 1, wherein said first node and said second node are co-located.

15. Apparatus for brokering carrier capacity, comprising:

(a) data processing means for accepting a first listing of carrier capacity parameters for a delivery route and storing said parameters for later comparison to a second listing of requested carrier capacity parameters; wherein said carrier capacity parameters further comprise volume increments, mode of transportation, and time parameters of said delivery route; said data processing means further for comparing said first listing to said second listing;

(b) means for determining a matched entry on said first listing and said second listing based upon said comparison of said carrier capacity parameters of said first listing and/or subsequent listings to said second listing;

(c) means for displaying said matched entry to a system operator;

(d) means for selecting said matched entry from among a possible plurality of matched entries;

(e) means for confirming said selection; and

(f) means for decrementing a volume measurement representative of said selection from said stored carrier capacity parameters and further for recalculating the available capacity on the basis of units of volume available to said mode of transportation at a particular time.

16. A method for brokering carrier capacity comprising the steps of:

(a) entering carrier capacity data into a data processing system having a real time clock for comparing actual time with carrier capacity data; said entering step further comprising entering a list of parameters that define available carrier capacity by volume increments into said data processing system, confirming said entry, and then saving said entry in a transportation database as available routes and assigning a pre-transaction code to said entry;

(b) entering a request for available routes into said data processing system, said request entry step further comprising defining a route and confirming that said defined route is a requested route;

(c) comparing said requested route with said available routes entered into said transportation database to determine whether or not a route match exists;

(d) activating a request database locator program within said data processing system for the purpose of querying said transportation database at predetermined time intervals to determine if a matching route selection has been entered into said transportation database;

(e) displaying a list of matching routes and corresponding pre-transaction code to a system operator;

(f) selecting a matching route by selecting its code from said list of matching routes, and then confirming said matching route selection; and

(g) saving said matching route selection to a transaction database and assigning a transaction code to said matching route selection.

17. The method of claim 16, wherein defining a route further comprises the steps of:

(a) defining a location start point of said route and a location end point of said route;

(b) defining a desired date and time for shipping and arrival corresponding to said route start point and said route end point;

and

(c) choosing a transportation medium.

18. The method of claim 17, wherein said transportation medium comprises a plurality of modes of transportation.

19. The method of claim 17, wherein said transportation medium is a single mode of transportation.

20. The method of claim 16, wherein a bill for services is prepared in respect of said transaction code.

21. The method of claim 16, wherein a transaction report is prepared in respect of said transaction code.

* * * * *

US006061667A

United States Patent [19]

Danford-Klein et al.

[11] Patent Number: 6,061,667

[45] Date of Patent: May 9, 2000

[54] **MODULAR RATING ENGINE, RATING SYSTEM AND METHOD FOR PROCESSING RATING REQUESTS IN A COMPUTERIZED RATING SYSTEM**

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[73] Assignee: **Schneider National, Inc.**, Green Bay, Wis.

[21] Appl. No.: **08/905,810**

[22] Filed: **Aug. 4, 1997**

[51] **Int. Cl.**[7] **G06F 17/00**

[52] **U.S. Cl.** **705/400**; 705/409; 705/406; 700/103

[58] **Field of Search** 705/402, 409, 705/30, 400, 406

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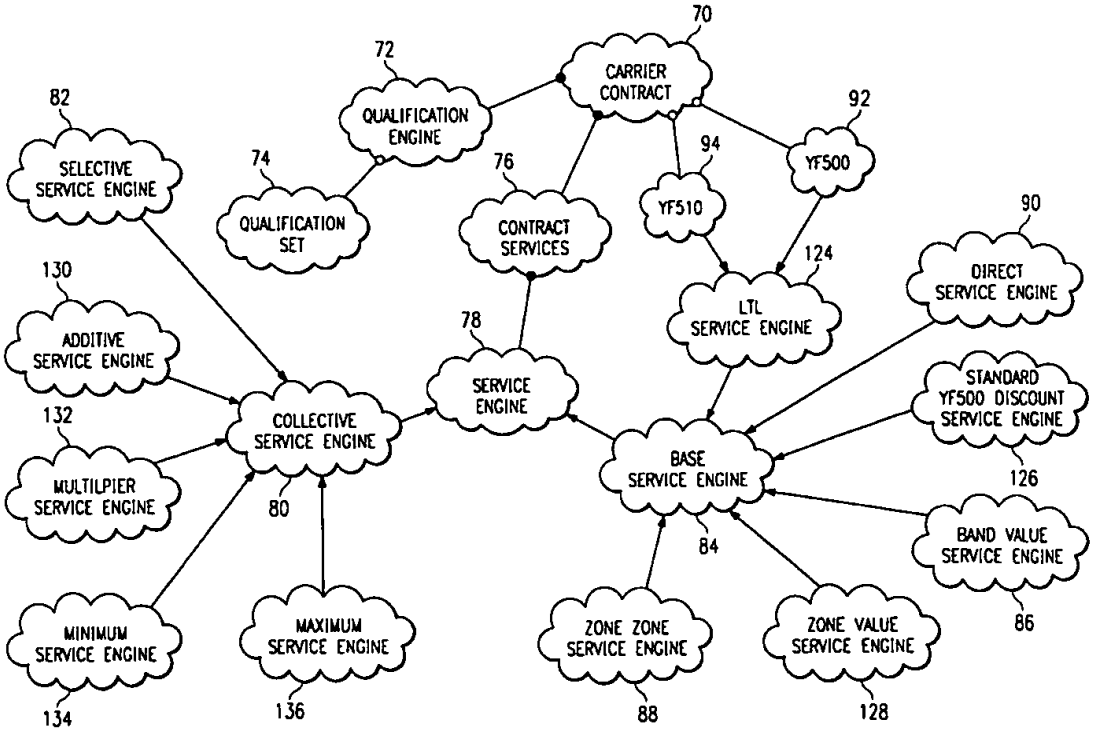
Primary Examiner—Emanuel Todd Voeltz
Assistant Examiner—William Brian Edge
Attorney, Agent, or Firm—Baker Botts L.L.P.

[57] **ABSTRACT**

The invention comprises a rating engine, system, and method for processing rating requests in a computerized rating system. One aspect of the invention is an object-oriented rating engine operable to receive a rating request associated with a carrier contract. The rating engine comprises a base rating engine object operable for use on a computer and further operable to calculate a linehaul rate in response to the rating request. The base rating engine object further comprises a rating method operable to calculate a linehaul rate and a rate data structure comprising at least one rate value. The rate data structure is accessible by the rating method for use in calculating a linehaul rate.

37 Claims, 5 Drawing Sheets



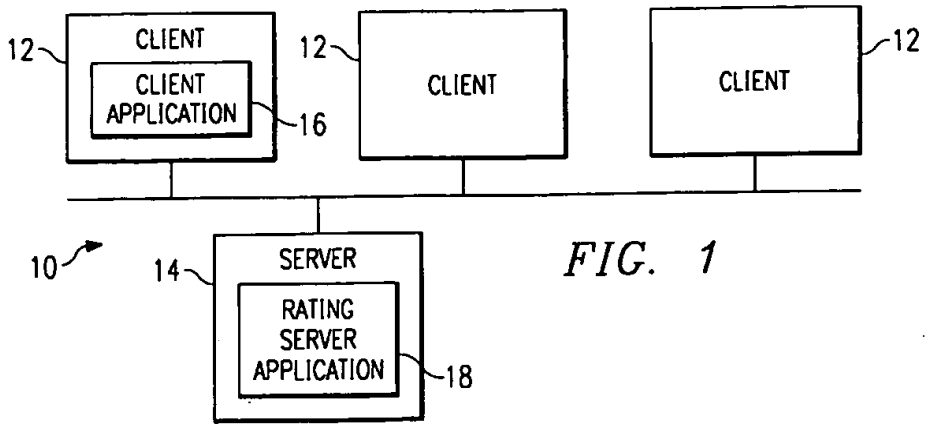


FIG. 1

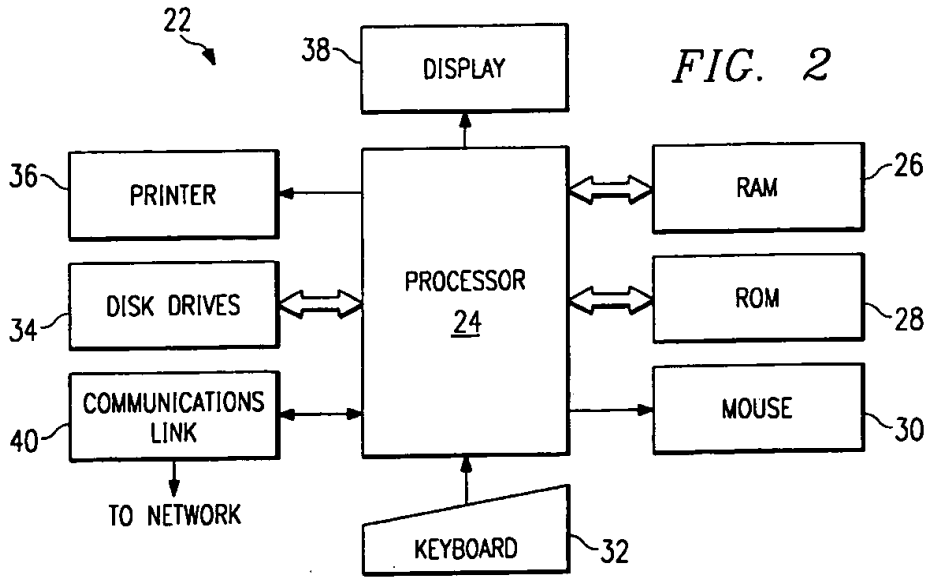


FIG. 2

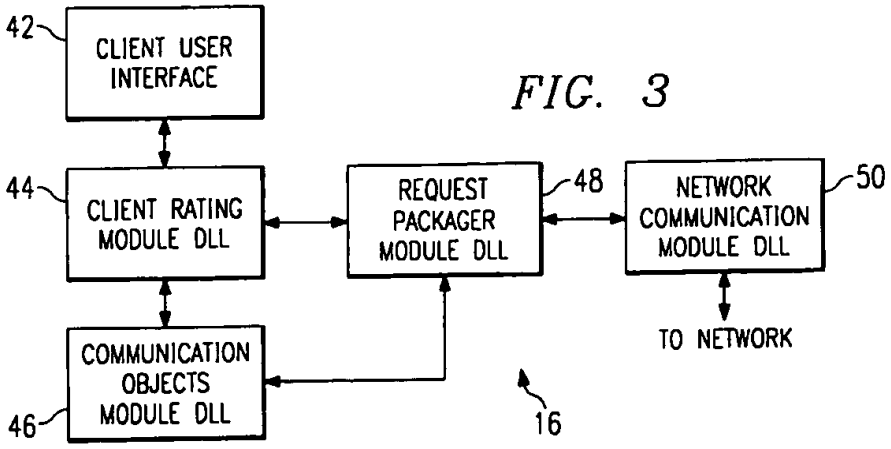


FIG. 3

FIG. 4

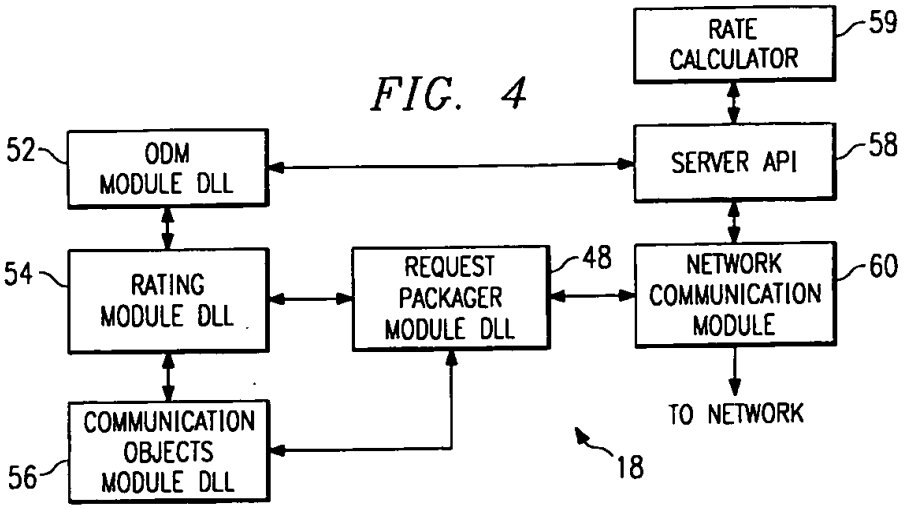


FIG. 5

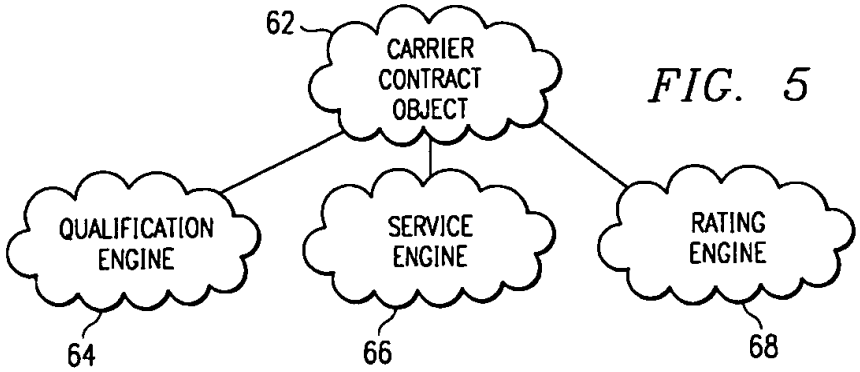


FIG. 8

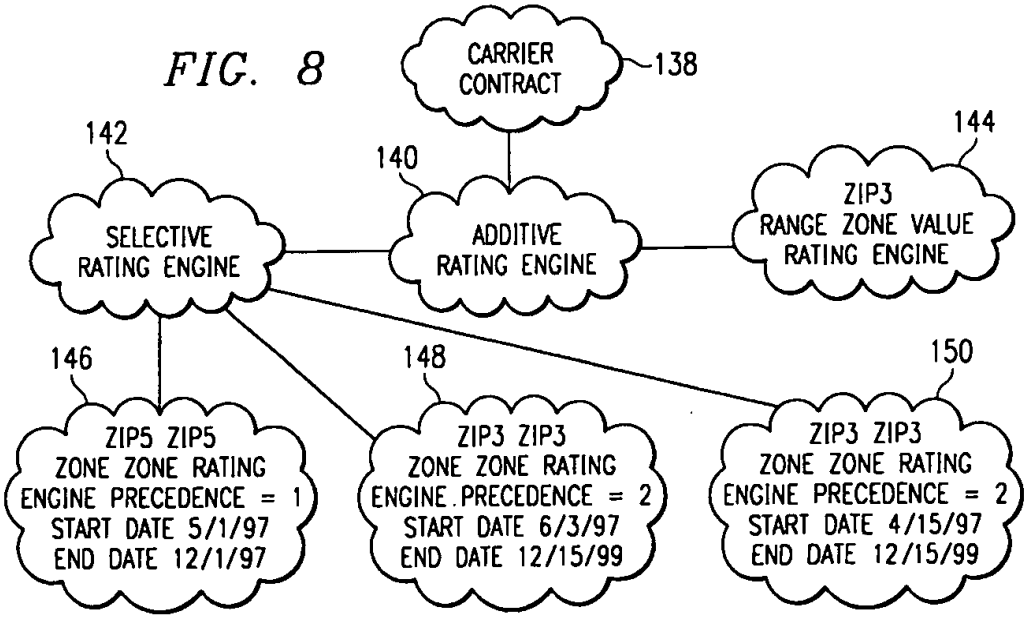
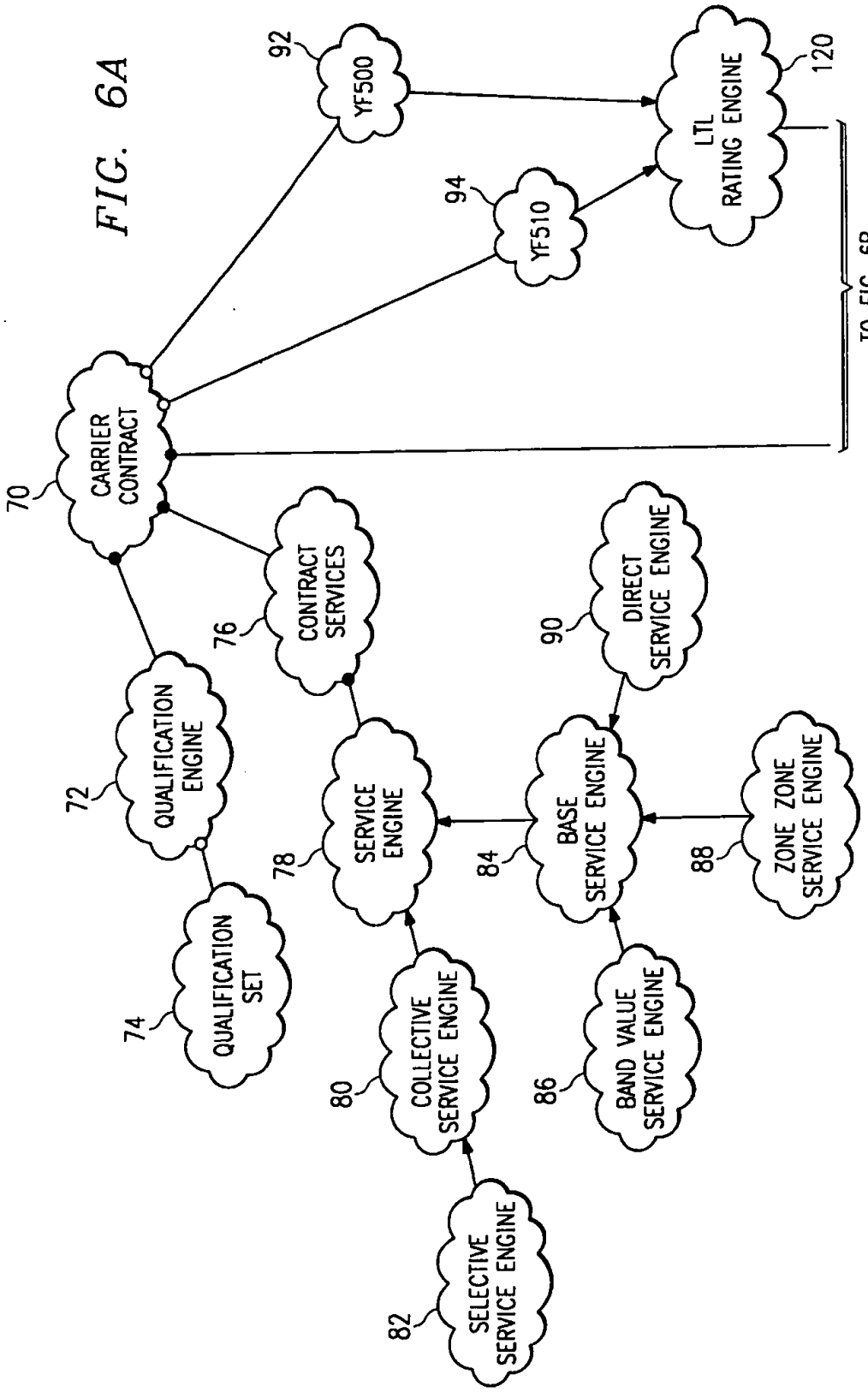


FIG. 6A


CARRIER CONTRACT
70
QUALIFICATION ENGINE
72
QUALIFICATION SET
74
CONTRACT SERVICES
76
SERVICE ENGINE
78
COLLECTIVE SERVICE ENGINE
80
SELECTIVE SERVICE ENGINE
82
BASE SERVICE ENGINE
84
BAND VALUE SERVICE ENGINE
86
ZONE ZONE SERVICE ENGINE
88
DIRECT SERVICE ENGINE
90
YF500
92
YF510
94
LTL RATING ENGINE
120
TO FIG. 6B

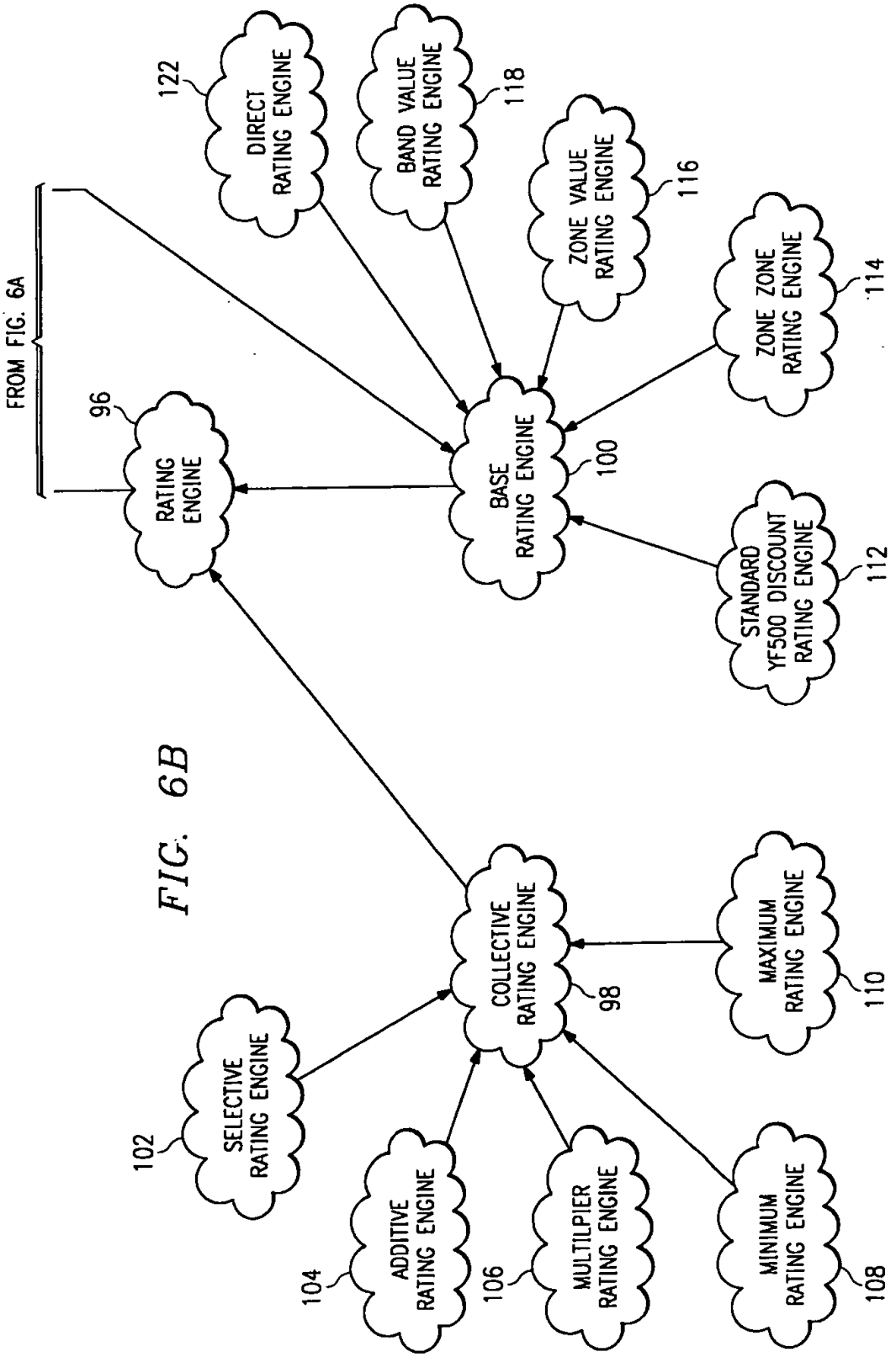

FROM FIG. 6A
96
RATING ENGINE
122
DIRECT RATING ENGINE
BAND VALUE RATING ENGINE
118
ZONE VALUE RATING ENGINE
116
ZONE ZONE RATING ENGINE
114
BASE RATING ENGINE
100
STANDARD YF500 DISCOUNT RATING ENGINE
112
COLLECTIVE RATING ENGINE
98
MAXIMUM RATING ENGINE
110
102
SELECTIVE RATING ENGINE
104
ADDITIVE RATING ENGINE
106
MULTILPIER RATING ENGINE
MINIMUM RATING ENGINE
108

FIG. 6B

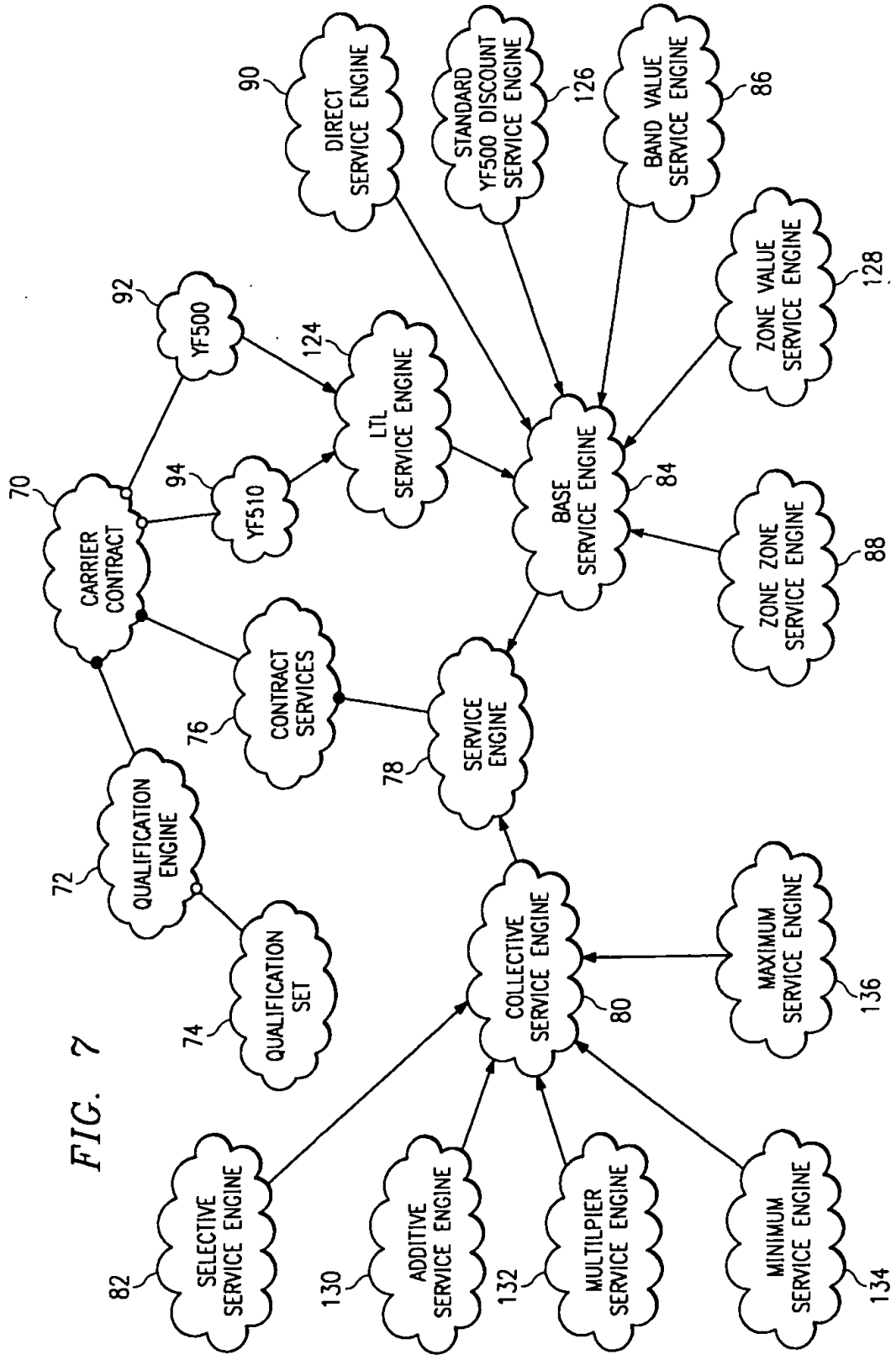

DIRECT SERVICE ENGINE
90
STANDARD YF500 DISCOUNT SERVICE ENGINE
126
BAND VALUE SERVICE ENGINE
86
YF500
92
LTL SERVICE ENGINE
124
ZONE VALUE SERVICE ENGINE
128
70
CARRIER CONTRACT
94
YF510
BASE SERVICE ENGINE
84
ZONE ZONE SERVICE ENGINE
88
CONTRACT SERVICES
76
SERVICE ENGINE
78
QUALIFICATION ENGINE
72
QUALIFICATION SET
74
COLLECTIVE SERVICE ENGINE
80
MAXIMUM SERVICE ENGINE
136
SELECTIVE SERVICE ENGINE
82
ADDITIVE SERVICE ENGINE
130
MULTIPLIER SERVICE ENGINE
132
MINIMUM SERVICE ENGINE
134

FIG. 7

MODULAR RATING ENGINE, RATING SYSTEM AND METHOD FOR PROCESSING RATING REQUESTS IN A COMPUTERIZED RATING SYSTEM

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is related to U.S. application Ser. No. 08/905,676 filed on Aug. 4, 1997, by Henrik Danford-Klein, et al. and entitled, "Object Oriented Rating System and Method."

This application is related to U.S. application Ser. No. 08/905,808 filed on Aug. 4, 1997, by Henrik Danford-Klein, et al. and entitled, "Qualification Engine, Rating System, and Method for Qualifying Rating Requests in a Computerized Rating System."

TECHNICAL FIELD OF THE INVENTION

This invention relates generally to computerized rating systems and more particularly, to a rating engine, system and method for processing rating requests in a computerized rating system.

BACKGROUND OF THE INVENTION

Members of the transportation industry contract with their customers to ship goods by truck, rail, ship, plane or other forms of transportation. Some transportation companies, such as Federal Express, may not have written contracts with small volume customers or individuals. On the other hand, Federal Express may have a written contract with special pricing and/or volume discounts for a larger customer, such as General Motors. Truckload carriers, such as Schneider National Carriers, Inc. often sign written contracts with customers that regularly ship large quantities of goods. These contracts will ordinarily specify whether a carrier will transport a load from one location to another, the conditions under which such transportation can occur, the price for such transportation, and the price for additional services associated with that particular shipment.

Accordingly, a particular contract between a carrier and a customer contains (1) qualifications that must be met for a shipment to occur pursuant to the contract, and (2) price terms for shipments that meet the qualifications for use of that contract. The term "contract" is meant to be broadly interpreted and may, but does not necessarily, refer to a single written contract between a carrier and a customer. A single written contract might contain several different sets of qualifications with a unique set of prices associated with each set of qualifications. A written contract between a carrier and a customer might contain multiple contracts as described here, or a contract may be the combination of multiple written contracts between the carrier and customer.

The qualifications associated with a particular contract limit the types of shipments allowed under the contract. Qualifications associated with a contract also specify the conditions under which particular prices for services provided pursuant to the contract apply. Examples of qualifications include, but are not limited to, equipment type, freight class, service type, weight, transportation mode, contract type, product class, product identification number, etc.

Contracts also include prices for services associated with shipments meeting the qualifications of the contract and provided pursuant to the contract. One type of service often provided pursuant to a particular contract is linehaul service.

A linehaul rate comprises the price charged to move a particular shipment between two points. Contracts often include prices for services provided other than linehaul service. Examples of such services include hand unload, stopoffs, tarps, warehouse service, etc. A table of example services is provided below.

A particular carrier may have many contracts with a given customer. These contracts will typically have different qualifications associated with them. For example, a particular carrier may have separate contracts with a customer for each of the following types of services: flatbed service, truckload service, less than truckload service, truckrail service and refrigerated trailer service. A carrier and customer may also have multiple contracts for a particular type of service. For example, a carrier and customer may have different contracts for less than truckload service based upon the freight class of the goods being shipped. In addition, the prices charged various customers may vary depending upon the volume of business conducted. In summary, a customer may have many different contracts with a particular carrier and a particular carrier may have many contracts with different customers for the same or similar services.

Customers may also have multiple contracts with many different carriers. Customers shipping a large amount of goods may exceed the shipping capacity of even several carriers combined. Certain carriers may only ship goods within certain regions, necessitating contracts between a customer and multiple carriers. In addition, a customer may desire to have contracts with multiple carriers in order to induce greater price competition. The term contract is also meant to broadly refer to shipments pursuant to a tariff, circular, or other type document.

Because both customers and carriers may maintain a large number of contracts, management of these contracts presents additional difficulties. To simplify this management task, customers, carriers, and logistics companies have employed computer software to calculate the price for a given shipment and to generate orders, bills, checks, and electronic payment for the shipment. Customers holding contracts with multiple carriers may use such software to compare prices available for a particular shipment so that the customer pays the lowest price for the shipment. This function is normally referred to as best rate lookup.

Some existing systems capable of calculating the price of a given shipment (rating) employ relational databases to store the data necessary to calculate a price. Unfortunately, each contract may include a large amount of price data, date ranges for which the price data is valid, and qualifications specifying the conditions under which such prices are applicable. Due to the many possible qualifications and date restrictions, these relational databases contain a large number of keys used to search the database. Although such keys are not considered to be redundant data in a relational database, the reality is that data ends up being replicated many times for use as a key for searching the database.

The use of relational databases for performing rating has a number of disadvantages. The large amount of redundant data resulting from the large number of keys in the database causes a substantial increase in storage requirements. Because the database is large, access times to retrieve the relevant data are relatively slow. Locating the relevant data in the database can take an unreasonable amount of time compared to the needs of many businesses utilizing such software.

Relational databases cause performance problems as well. A substantial amount of time is wasted in such systems

searching for price data that turns out to be unusable because the qualifications for use of the price data are not met. To determine that the price data is unusable, the data must still be located in the database. After locating the data, all of the relevant qualifications are matched against the rating request and if a particular condition is not met, then all of the time locating the relevant data has been wasted.

Performance problems are magnified when a customer or logistics company desires to perform optimization. Optimization requires the performance of even more calculation as the software must compute the price charged by multiple carriers for a particular shipment.

SUMMARY OF THE INVENTION

The present invention attains improved performance versus existing systems by employing modular rating engines to achieve a logical grouping of contract rating data used to calculate linehaul rates. One aspect of the invention is an object-oriented rating engine operable to receive rating requests associated with a carrier contract. The rating engine comprises a first base rating engine object operable for use on a computer and further operable to calculate a linehaul rate in response to the rating request. The base rating engine object further comprises a rating method operable to calculate a linehaul rate and a rate data structure comprising at least one rate value wherein the rate data structure is accessible by the rating method for use in calculating a linehaul rate.

The invention has several important technical advantages. The invention allows a modular approach to construction of rating engines that creates a flexible system from which a complex rating engine for a particular carrier contract may be created. This modular approach also allows new types of rating engines to be easily developed without affecting the function of existing rating engines. Because rate calculation for many different types of rates is similar, the use of modular rating engines allows the invention to take advantage of these similarities, making data entry easier, reducing data redundancy, and, in turn, reducing storage requirements. The use of modular rating engines also greatly increases the speed for calculating the cost of linehaul service in response to a rating request.

Another aspect of the invention is the grouping of rating data by effective dates. According to this aspect of the invention, rating data for a particular carrier contract may be grouped together such that the rating data contained in a particular rating engine object is valid only for a date range that applies to all data contained in the object. The grouping of rating data by effective date avoids the redundancy of storing date information at the lane level, thus lowering storage requirements and increasing calculation speed. The invention avoids unnecessary data location operations by determining quickly whether a particular rating engine has a date range applicable to the rating request.

BRIEF DESCRIPTION OF THE DRAWINGS

For a more complete understanding of the present invention and the advantages thereof, reference is now made to the following descriptions, taken in connection with the accompanying drawings, in which:

FIG. 1 illustrates an example of a computer network configuration that may be used for a computerized rating system constructed in accordance with the invention;

FIG. 2 illustrates a diagram of an exemplary general purpose computer that may be used in the network of FIG. 1;

FIG. 3 illustrates a block diagram of a client that may be used in a computerized rating system constructed in accordance with the invention;

FIG. 4 illustrates a block diagram of a rating server that may be used in a computerized rating system constructed in accordance with the invention;

FIG. 5 illustrates a diagram of a portion of a computerized rating system constructed in accordance with the invention;

FIG. 6 illustrates an object class diagram comprising a portion of one embodiment of a computerized rating system constructed in accordance with the invention;

FIG. 7 illustrates an object class diagram of a portion of a second embodiment of a computerized rating system constructed in accordance with the invention; and

FIG. 8 illustrates an object diagram of a portion of a computerized rating system constructed in accordance with the invention.

DETAILED DESCRIPTION OF THE INVENTION

The preferred embodiment of the present invention and its advantages are best understood by referring to FIGS. **1–8** of the drawings, like numerals being used for like and corresponding parts of the various drawings.

FIG. **1** illustrates a computer network **10** that may be used for a computerized rating system constructed in accordance with the teachings of the invention. Although the invention is shown in a client server environment, the invention can be used in any computer environment. Computer network **10** comprises one or more client computers **12** connected through a computer network to one or more computers **14**.

In this example, one client computer **12** is running a client application **16** that may be used to perform a rating operation by accessing contract data associated with carrier contracts. Rating server application **18** is running on server computer **14** and is operable to receive rating requests from client application **16** through computer network **10**. A user of client computer **12** that desires to determine the price for a particular shipment of goods, generate an order for such shipment, generate a bill for such shipment, and/or cause payment for such a shipment, uses client application **16** to generate such a request to rating server application **18**. Rating server application **18** performs the necessary calculations and returns the results to client application **16**.

FIG. **2** illustrates a general purpose computer **22** that may be used for client computer **12** and/or server computer **14** of FIG. **1**. General purpose computer **22** may be used to execute applications comprising computerized rating systems constructed in accordance with the present invention. General purpose computer **22** may be adapted to execute any of the well-known MS-DOS, PC-DOS, OS2, UNIX, MAC-OS and WINDOWS operating systems or other operating systems. General purpose computer **22** comprises processor **24**, random access memory (RAM) **26**, read only memory (ROM) **28**, mouse **30**, keyboard **32** and input/output devices, such as printer **36**, disk drives **34**, display **38** and communications link **40**. The present invention includes programs that may be stored in RAM **26**, ROM **28** or disk drivers **34** and may be executed by processor **24**. Communications link **40** is connected to computer network **10** but could be connected to a telephone line, an antenna, a gateway, or any other type of communication link. Disk drives **20** may include a variety of types of storage media such as, for example, floppy disk drives, hard disk drives, CD ROM drives, or magnetic tape drives. Although this embodiment

employs a plurality of disk drives **34**, a single disk drive **34** could be used without departing from the scope of the invention. FIG. **2** only provides one example of a computer that may be used with the invention. The invention could be used on computers other than general purpose computers, as well as on general purpose computers without conventional operating systems.

FIG. **3** illustrates a block diagram of an embodiment of client **16**. Client **16** may be stored in RAM **26**, ROM **28** or disk drives **34** of general purpose computer **22** or on a different computer. Client user interface **42** uses client **16**, which comprises client rating module dynamic link library **44**, communication objects module dynamic link library **46**, request packager module dynamic link library **48**, and network communication module dynamic link library **50**. This embodiment of client **16** comprises a 32-bit version employing WINDOWS dynamic link libraries. Other embodiments of client **16** may include a 16-bit version implemented with WINDOWS dynamic link libraries and a UNIX version. The 16-bit WINDOWS version of the client application employs a THUNK conversion, such as is commonly performed in the WINDOWS operating system.

A client user interface **42** desiring to obtain rating information will make a request using client rating module dynamic link library **44**. This request will result in procedure calls to client rating module dynamic link library **44**. Client rating module dynamic link library **44** provides access to functions of the rating server **18**. Client rating module dynamic link library **44** provides access to the same exported functions found in the rating module dynamic link library of rating server **18** which normally executes on server computer **14**. By having the same exported functions for both the client rating module dynamic link library **44** and the rating module dynamic link library of the rating server **18**, the dynamic link libraries may be used interchangeably. This means that if there is a need for a stand-alone version of the system, a user may obtain the rating module dynamic link library for rating server application **18** and substitute it for client rating module dynamic link library **44**. In other words, a particular user may be given a personal copy of the rating information maintained by the rating module dynamic link library of rating server **18**.

Returning to the operation of client **16**, client rating module dynamic link library **44** will make appropriate calls to request packager module dynamic link library **48**. Based upon the service requested, request packager module dynamic link library **48** will build a request object which contains an identifier for the function desired on rating server **18**, the total amount of data to send, and any additional objects required as input parameters to the function on rating server **18**. The request packager module dynamic link library **48** will then call a send-type function in the network communication module dynamic link library **50** and will wait for a result object to be returned.

Network communication module dynamic link library **50** will send the request packet and additional objects to server computer **14**. After server computer **14** has completed processing the request, it sends the result back to network communication module dynamic link library **50**, which returns it to the request packager module dynamic link library **48**. When request packager module dynamic link library **48** receives the return data packet, it breaks it down into the appropriate objects and passes the data back to client rating module dynamic link library **48**. Client rating module dynamic link library **44** returns the data and/or result to the calling function in client user interface **42**. Communication objects module **46** may provide a common set of structures or classes for data passing. In other words, communication objects module dynamic link library **46** may provide a library of structures that may be used by client rating module dynamic link library **44** and/or request packager module dynamic link library **48** to pass data to server computer **14**.

FIG. **4** illustrates a block diagram of an embodiment of rating server **18** constructed in accordance with the invention. Rating server **18** may be stored in RAM **26**, ROM **28**, or disk drives **34** of general purpose computer **22** or in another location. In addition, both client **16** and rating server **18** may be stored on the same computer. Rating server **18** comprises rating module dynamic link library **54**, communication objects module dynamic link library **56**, request packager module dynamic link library **48**, server API **58**, rate calculator **59**, and network communication module **60**. ODM module DLL **52** uses rating server **18** and may attain such access either through rating module DLL **54** or server API **58**. Applications will preferably access rating server **18** using server API **58** unless it is incapable of using application program interfaces.

In operation, network communication module **60** receives a request packet from the network and passes the completed request packet to server API **58**. Server API **58** generates the appropriate call to rate calculator **59**, which comprises a dynamic link library. The results of the calculation are returned to the network by server API **58** and network communications module **60**.

Alternatively, requests can be made through rating module DLL **54** in a manner similar to that described with respect to FIG. **3**. In this embodiment, request packager module dynamic link library **48** is identical to its counterpart in client **16**, but could be tailored to specific functions required by rating server **18**. The same is true for communication objects module DLL **56** and network communication module DLL **60**.

Server API **58** may be used to access rating services. It allows queries of statistical information, as well as control of rating calculator **59**. Statistical information includes current connections, execution duration, and total connections. Server API **58** may unload and reload rating calculator **59**, as well as reload specific rate information for a given rating calculator **59**. Server API **58** uses the same request/result data formatting via network communication module **60** as used by clients to obtain rating information using rating module DLL **54**. Accordingly, server API **58** may be run on any computer that has access to rate calculator **59** on server computer **14**. Such access may include network access.

ODM module dynamic link library **52** comprises an optimization data manager application that may be used to perform optimization functions, such as identifying the least expensive carrier for a specific shipment of goods. ODM module dynamic link library **52** may directly access functions in server API **58** or indirectly through rating module dynamic link library **54**.

Although examples of client **16** and rating server **18** have been provided, other embodiments could be used without departing from the scope of the invention. In addition, different embodiments may be created for different operating systems and/or environments. Finally, the teachings of the present invention may be used for a stand-alone application rather than an application used in a client server environment.

FIG. **5** illustrates an architectural diagram of a portion of rate calculator **59** in rating server **18**. In a computerized rating system constructed in accordance with the invention, data is organized based upon carrier contracts. Each carrier

contract is associated with at least one carrier contract object 62. Thus, at least a portion of a computerized rating system constructed in accordance with the teachings of the invention is object-oriented. As shown in FIG. 5, a particular carrier contract object 62 may access a qualification engine 64, service engine 66, and/or rating engine 68.

The functions performed by qualification engine 64, service engine 66, and rating engine 68 are best understood by examining the operation of these engines in calculating the price for a particular shipment. Although the function will be described in more detail below, a brief overview is now provided. Carrier contract object 62 is operable to receive a rating request containing a collection of data parameters specifying all of the information needed to calculate the price of a particular shipment of goods from one point to another, including all services associated with that request. Carrier contract object 62 first uses qualification engine 64 to determine whether the carrier contract represented by carrier contract object 62 is qualified based upon the conditions specified in the rating request. If carrier contract object 62 is not qualified to process the rating request, then a rate not found message is returned in response to the rating request. If the carrier contract is qualified to process the rating request, then it determines the price for the shipment identified in the rating request using service engine 66 and rating engine 68.

Rating engine 68 calculates the linehaul rate corresponding to the rating request. Service engine 66 may be used to calculate the price of all other relevant services that are called for by a rating request. There are many different types of services that may be provided pursuant to a rating request. Examples of such services are included below in Table 1.

The cost of linehaul service is calculated by this embodiment of rating engine 68, while the cost of other services are calculated by service engine 66. In an alternative invention (not explicitly shown), the cost of linehaul service could be calculated by service engine 66. In such an alternative embodiment, the functions of rating engine 68 would be incorporated into service engine 66. Thus, the cost of linehaul service may be treated as just one type of service that may be called for by a rating request. Depending upon the design of service engine 66, it may be desirable to have a separate rating engine 68 to calculate the cost of linehaul service.

In this embodiment, qualification engine 64 comprises one or more software objects. An exemplary embodiment of qualification engine 64 will be discussed below in connection with FIGS. 6 and 7. In this example, qualification engine 64 comprises an instance of a qualification engine object class and is contained in carrier contract object 62.

The use of qualification engine 64 facilitates grouping of rating data by qualifications. Grouping of data by qualifications results in faster access to rating data, as well as a large reduction in redundant data compared to existing systems. Qualifications limit the types of shipments that rating data applies to. As noted above, carriers often have multiple contracts with a particular customer where each contract has different qualifications. In this embodiment, the qualifications associated with a particular contract may include, but are not limited to, equipment type, freight class, contract type, transportation mode, weight value, service level, stop value, bill-to code, quote number, and/or equipment owner identification. Transportation mode refers to various different types of transportation such as rail, small package, less than truckload, truckload, truck rail, refrigerated, etc. Contract type refers to various types of contracts such as base, continuous move, round trip, dedicated, and/or expedite. Product class may generally refer to classes of products such as frozen, refrigerated, heated, or dry.

Qualification engine 64 has access to a plurality of sets of qualifications. Each qualification set includes one or more qualifications applying to a particular class of contracts. The invention takes advantage of the fact that many participants in the transportation industry use contracts with identical qualifications for identical types of services. For example, many carriers that provide refrigerated trailer service may have the same qualifications associated with their contracts for refrigerated service. Similarly, many truck rail equipment carriers may have identical qualifications for their truck rail service contracts with customers. By taking advantage of similarities in qualifications, the invention reduces the amount of data redundancy, as a single set of qualification data need only be stored once and can be used with many contracts. The qualification engine 64 is also flexible enough to handle special contracts that may only apply to a single contract between a single carrier and a single customer. In such a case, a special qualification set is created for that carrier contract and can be accessed by qualification engine 64. The invention thus takes advantage of similarities in qualifications between contracts, but remains flexible enough to handle special cases.

Qualification types fall into two major categories: matching and bounds. The first type, matching qualifications, comprise a qualification type and a value. Matching qualifications are generally used where a qualification parameter sent with a rating request has to match a member of a qualification set exactly. For example, equipment type will normally be a matching type qualification. A rating request for a van trailer would normally specify a 45-foot, a 48-foot, or a 53-foot van trailer. To be qualified, the carrier contract would have to be associated with a qualification set that includes a van trailer of 45 feet, 48 feet, or 53 feet.

The other category of qualification types is bounds qualifications. Bounds qualifications normally comprise a qualification type, a bound operand, and a value. To determine whether a particular qualification parameter supplied with a rating request meets a bounds-type qualification contained in the qualification set, the value of the qualification parameter is compared with the value of the qualification stored in the qualification set using the bound operand. For example, load weight may be a bounds-type qualification. A particular carrier may desire not to carry any load over 50 tons. In such a case, a qualification in the qualification set may be that load weight is less than 50 tons. In this example, the qualification type is load weight, the bound operand is less than, and the value is 50 tons. In processing a rating request, qualification engine 64 would compare the load weight provided with the rating request and determine whether it was less than 50 tons. If so, then the qualification engine 64 would determine that the carrier contract was qualified for the shipment corresponding to the rating request, assuming that all other qualifications were met.

In summary, a qualification request may include a qualification parameter comprising a parameter type and a parameter value. To determine whether this qualification parameter meets a bounds type qualification in a qualification set, qualification engine 64 compares the qualification parameter to the bounds qualification requirement, wherein the qualification type of the bounds type qualification requirement matches the qualification parameter's parameter type and the qualification engine compares the parameter value to the bounds type qualification value using the bound operand. If

the parameter value is within the bounds set by the bound operand and qualification value, then a true result is produced in response to the comparison.

Qualification engine **64** implements matching-type qualifications by using an equality operator between the qualification type and qualification value in the qualification set. In a sense, then, all qualifications can be implemented as bounds-type qualifications in this embodiment of the invention. Qualification sets could be implemented differently, however, without departing from the scope of the invention.

The equipment type qualification cited in the example above could be implemented as a bounds type qualification. In this embodiment of qualification engine **64**, each equipment type is assigned a numerical equipment ID. If a particular qualification set included equipment types 10–15, then the qualification set could include a range-type bounds operand where the equipment ID range is between 10 and 15. This example also illustrates that a bounds type qualification might have multiple bounds values associated with it, particularly when a range operand is employed.

To determine whether a carrier contract is qualified to process a particular rating request, carrier contract object **62** generates a qualification request to qualification engine **64**. Qualification engine **64** then determines whether the set of qualification parameters passed with the qualification request is a subset of the qualification set associated with the carrier contract represented by carrier contract object **62**.

For example, suppose that a standard flatbed contract has the following qualification set: equipment type equals 48 foot flatbed trailer, equipment type equals 45 foot flatbed trailer, equipment type equals 48 foot flatbed sliding tandem, and weight is less than fifty tons. Suppose that the qualification request to qualification engine **64** contains the following parameters from a rating request sent to carrier contract object **62**: equipment type equals 45 foot flatbed trailer, and weight equals thirty tons. In this example, qualification engine **64** would determine that the contract is qualified to handle this request. The two member set of qualification parameters is a subset of the four member qualification set, taking into account bounds operands. The equipment type parameter appears in the qualification set and the weight parameter satisfies the condition imposed by the bounds type weight qualification in the qualification set. If, on the other hand, the qualification parameter for equipment type was for a fifty-three foot van trailer, then qualification engine **64** would have returned a negative response to the qualification request indicating that the carrier contract associated with carrier contract object **62** was not qualified for the shipment requested pursuant to the rating request.

As noted, this embodiment of qualification engine **64** comprises an object contained in carrier contract object **62**. Qualification engine **64** further comprises a qualifying method operable to compare the qualification parameters provided with a qualification request to a set of qualification requirements to determine whether the carrier contract is qualified.

If qualification engine **64** determines that carrier contract object **62** is qualified to handle a particular rating request, then carrier contract object **62** will determine the linehaul rate using rating engine **68**. Rating engine **68** comprises one or more instances of a collection of rating engine object classes. Accordingly, rating engine **68** may be comprised of one or a plurality of software objects. The structure and operation of rating engine **68** will be more fully described in connection with FIG. **6** below. In this embodiment, rating engine **68** comprises an object or objects contained in carrier contract object **62** and may also include one or more objects used by carrier contract object **62**.

After calculating a linehaul rate using rating engine **68**, carrier contract object **62** will use service engine **66** to calculate the price for various additional services that may be included in the rating request. Similar to rating engine **68**, service engine **66** comprises one or more software objects contained in carrier contract object **62** and may contain one or more objects used by carrier contract object **62**. Again, the structure of service engine **66** will be described more fully in connection with FIG. **6** below.

Although the structure illustrated in FIG. **5** provides one embodiment of a rating system constructed in accordance with the invention, various substitutions may be made without departing from the scope of the invention. For example, although qualification engine **64**, service engine **66**, and rating engine **68** each include one or more objects contained in carrier contract object **62**, these objects might only be used by carrier contract object **62** and not contained therein. In addition, rather than implementing these engines as separate objects, any one or more of these engines could be implemented as methods of carrier contract object **62**. These engines could also be implemented as software modules accessible through ordinary procedure calls from carrier contract object **62**.

Although a number of qualification types have been listed, more or less qualification types could be used without departing from the scope of the invention. A particular qualification set may include one or more of the qualification types and need not include a qualification of every type. Other categories of qualifications other than matching or bounds qualifications could also be used.

FIG. **6** illustrates a class diagram of a portion of an exemplary computerized rating system constructed in accordance with the invention. In this embodiment, instances of the object classes illustrated in FIG. **6** will form a portion of rating server application **18**. FIG. **6** illustrates the object classes that may be used to represent a particular carrier contract. As is commonly done in object class diagrams, an arrow on the line joining two object classes indicates inheritance, an open circle indicates that an object is used by another object, while a closed circle indicates that an object is contained in another object.

In this embodiment, qualification engine object class **72** defines the object class for a qualification engine. An instance of qualification engine object class **72** is contained in carrier contract object class **70**. Carrier contract object class **70** contains information about a specific carrier contract. Here, each carrier and each customer are assigned an identification number. Those numbers are stored in instances of carrier contract object class **70**. Carrier contract object class **70** contains a contract type identification and transportation mode identification. An instance of carrier contract object class **70** also contains qualifications, rates and services which are implemented as a plurality of instances of the object classes illustrates in FIG. **6**. These objects are contained in the instance of carrier contract object class **70**. Carrier contract object class **70** also contains methods used for rating a request using the qualifications, rates and services.

Qualification engine object class **72** comprises an object class. Each instance of carrier contract object class **70** also contains an instance of qualification engine object class **72**. Qualification set object class **74** is an object class containing each of the qualification sets that may be used to qualify a

particular rating request. In this embodiment, only one instance of qualification set **74** is used. Each instance of qualification engine object class **72** uses the single instance of qualification set object class **74** for qualifying a rating request.

Certain qualifications may be considered so general that a method contained in carrier contract object class **70** is used to partially qualify a rating request. In such a circumstance, an instance of carrier contract object class **70** would store at least a subset of the qualifications associated with that carrier contract. For example, in this embodiment, the contract type and transportation mode qualifications are implemented by placing those qualifications directly in carrier contract object class **70**. These qualifications could be placed in one of the qualification sets stored in qualification set object class **74**. Contract types include but are not limited to one way moves, continuous moves, round-trip moves and dedicated moves. Transportation modes include but are not limited to truckload/van, less than truckload, rail, air, truckload/flatbed, truckload/bulk, vessel, small package and truck/rail. Although these transportation modes may not be considered to be such in the strictest sense, they may provide convenient categorizations for a computerized rating system.

An instance of carrier contract object class **70** contains a qualification set identification that allows the qualification engine to determine which qualification set in the instance of the qualification set object class **74**, to use for qualifying a particular rating request. This instance variable could also be stored in an instance of qualification engine object class **72**.

Qualification engine object class **72** comprises a method operable to compare qualification parameters associated with a rating request to a qualification set to determine whether the carrier contract is qualified to handle a particular rating request. The sets of qualification requirements are stored in qualification set object class **74**. The data structure containing the qualification sets is implemented as a list of lists. Each item in the primary list is a qualification set while each item in a qualification set comprises a matching or bounds type qualification. In this embodiment, each element of a qualification set comprises a qualification ID, a bound operand and one or more bound values. Other data structures could be used to store the qualification sets without departing from the scope of the invention.

This embodiment requires certain qualification parameters to be present in any rating request. The contract type, transportation mode, equipment type, and commodity type are all required parameters. These qualification types may or may not be utilized by an instance of qualification engine object class **72** to qualify a given rating request but are required to be in that request in case they are needed to qualify the request. The commodity may be identified by the freight class, product class or product identification number. More or less qualifications may be required to be included in a rating request without departing from the scope of the invention.

Other qualifications may include weight, service level, stop/activity type, bill-to code, quote number, equipment ownership, terms and volume number. The volume number would be used for contracts applying to special volume discounts. Again, other qualifications could be used or some of these qualifications not used without departing from the scope of the invention. The operation of instances of qualification engine object class **72** is described above with respect to qualification engine **64** illustrated in FIG. **5**. Qualification engine **72** accesses a particular qualification set using messages sent to the single instance of qualification set object class **74**.

Although one embodiment of object classes that may be used to create a qualification engine have been illustrated in FIG. **6**, other embodiments may be used without departing from the scope of the invention. For example, although an instance of qualification engine object class **72** is contained in an instance of carrier contract object class **70**, that object could be used by a carrier contract object. The qualification engine object could be contained in another object associated with a carrier contract object. The term "associated" is used broadly and includes, for example, objects used by the carrier contract object and/or objects contained in the carrier contract object. Also, the qualification engine could be implemented as methods of the carrier contract object rather than as a separate object. The qualification engine could even be a collection of procedures not implemented in an object-oriented fashion, but accessible by a carrier contract object. Although this implementation uses an instance of qualification engine object class **72** for each carrier contract object, a single instance of qualification object class **72** could be shared among multiple carrier contract objects in a slightly different implementation of the invention.

Similarly, although the qualification set information is stored in a single instance of qualification set object class **74**, the qualification set associated with a particular carrier contract could be stored as an instance variable in an instance of carrier contract object class **70** or qualification engine object class **72**. In addition, an instance of qualification set object class **74** could be contained in each instance of qualification engine object class **72** rather than used by such an instance. Multiple instances of qualification set object class **74** could also be created such that each qualification set comprised a separate instance of the object class. Any of these options and other options can be used without departing from the scope of the invention.

Turning to object classes relating to the rating engine function, the following object classes illustrated in FIG. **6** may be used to create rating engine **68** of FIG. **5**: rating engine object class **96**, collective rating engine object class **98**, base rating engine object class **100**, selective rating engine object class **102**, additive rating engine object class **104**, multiplier rating engine object class **106**, minimum rating engine object class **108**, maximum rating engine object class **110**, standard YF 500 discount rating engine object class **112**, zone zone rating engine object class **114**, zone value rating engine object class **116**, band value rating engine object class **118**, LTL rating engine object class **120**, direct rating engine object class **122**, YF 500 object class **92**, and YF 510 object class **94**. Because of the modular architecture of this embodiment of the invention, an actual rating engine comprises instances of one or more of these objects contained in an instance of carrier contract object class **70**, Exceptions to this rule are instances of YF 500 object class **92** and YF 510 object class **94**. Only a single instance of these objects exists in this embodiment of the invention and these objects may be used by an instance of carrier contract object class **70** and/or LTL rating engine object class **120**. Other types of standalone rating engine object classes such as YF 500 object class **94** could be included and links maintained to carrier contract object class **70** without departing from the scope of the invention. Such engines may be preferable where rating data is consistent for many contracts.

Rating engines are designed to process different rate structures which include geography matrices, mileage bands, weight bands and complex combinations of these matrices and bands. These base rating engines contain the

actual price data used to calculate the price for linehaul service. The price data is made up of an index type, origin/destination type or band type, a unit of measure, and effective dates. In addition to these specific base rating engines, there are rating engines which are collections of rating engines. Such rating engines are known as collective rating engines and include the selective, additive, multiplier, minimum, and maximum engines. Collective rating engines do not contain actual price data but instead contain other rating engines which could be base rating engines, as well as other collective rating engines. Collective rating engines also include the methods for uniquely processing the associated collection of rating engines.

Each rating engine associated with an instance of carrier contract object class **70** will be of a specific engine type, unit of measure code, effective start date, and effective end date. Other characteristics may be included, or some of these characteristics may be omitted from the rating engine without departing from the scope of the invention. As will be described more fully below, a rating engine may turn out to be a tree of instances of rating engine objects. In order to represent this hierarchy, each rating engine maintains a field noting its parent and a field noting its priority. Priority will also be discussed below.

The modular approach to constructing rating engines creates a flexible system from which a complex rating engine for a particular instance of carrier contract object class **70** may be created The modular approach also allows new types of rating engines to be easily developed without affecting the function of existing rating engines. Modularity also greatly increases the speed for calculating the cost of linehaul service in response to a rating request. Because rate calculation for many different types of rates is similar, the use of modular rating engines allows a computerized rating system constructed in accordance with the invention to take advantage of these similarities, making data entry easier, reducing data redundancy and, in turn, reducing storage requirements and allowing rating information to be loaded directly into memory of server computer **14**.

In the embodiment illustrated in FIG. **6**, all specific base rating engines and specific collective rating engines inherit from either collective rating engine object class **98** or base rating engine object class **100** and, in turn, from rating engine object class **96**. Therefore, these engines are all descendants of some basic type of engine and have specific attributes and methods which facilitate the effective decomposition of a very complex data model.

Before discussing more details of how a rating engine is constructed using the noted object classes, the function of various specific base and collective rating engines will now be discussed. Zone value rating engine object class **116** is designed to support a geography structure for assigning a price to an origin zone or a destination zone. Such a base rating engine will be useful to implement an engine for calculating destination fees for calculating continuous move costs. This rating engine is designed to return a price value based upon a geographic zone.

An instance of zone zone rating engine object class **114** will support geography structures for determining the price of an origin/destination-type charge. The rate structure for a particular carrier contract can be as simple as a state-to-state matrix or can also have an override matrix for Zip 3 to Zip 3 within it. These types of matrices may be implemented using a zone to zone rating engine. An origin or destination may be specified by its five-digit zip code (Zip 5), three-digit zip code (Zip 3), standard point location code (SPLC), state and/or country. Accordingly, an instance of zone zone rating engine object class **114** may be used to calculate origin/destination linehaul service charges for a shipment between the following origin/destination combinations: Zip 5 to Zip 5, SPLC to SPLC, SPLC to Zip 3, SPLC to State, Zip 3 to SPLC, Zip 3 to Zip 3, Zip 3 to State, State to SPLC, State to Zip 3, Zip 3 Range to Zip 3 Range (open ranges), State to State, and Country to Country. Other origin/destination combinations could be implemented using zone zone rating engine object class **114** without departing from the scope of the invention.

Band value rating engine object class **118** may be used to implement a rating engine that maps a price to a band of values for a specific unit of measure. Accordingly, this object class may be used to implement weight band and mileage band rate structures.

Direct rating engine **122** may be used to implement an engine to calculate a price for a contract that contains just one price structure which includes the price and minimum charge. This type of rating engine is useful to implement charges for services with a flat rate. For example, Federal Express may have a flat rate for shipping a product with a certain class of service in the United States.

YF 500 object class **92** and YF 510 object class **94** are used to calculate the Yellow 500 less than truckload tariff and Yellow 510 less than truckload tariff, respectively. Because of the large amount of data involved for these two tariffs, a computerized rating system implemented in accordance with this embodiment of the invention, will only have a single instance of these two object classes that will be used by an instance of LTL rating engine object class **120** and/or an instance of carrier contract object class **70**.

Standard YF 500 discount rating engine object class **112** is used to implement an engine to calculate a discount to apply to the Yellow 500 tariff. This engine will be based on a standard discount tariff for Yellow 500. It will comprise an origin discount based upon a Zip 3 origin, a destination discount based on a Zip 3 origin, a global discount, and a service area defined by Zip 3 ranges. The logic of an instance of standard YF 500 discount rating engine object class **112** will verify that the origin or destination of the request are both in the service area vector and will stop if they are not. The object will then look up an origin discount in the origin discount vector. If an origin discount is found, then that discount will be returned; otherwise, the object will continue. If an origin discount was not returned, then the object will search for a destination discount and the destination discount vector and return one, if found. If no origin or destination discount was found, the object will return the global discount.

Turning now to the function of specific collective rating engines, a general description of a collective rating engine may prove helpful. An exemplary collective rating engine contains a list of rating engines and a method to rate a request against the list. In some collective rating engines, this list is an ordered list organized primarily by a priority value, and secondarily by the effective start date assigned to the rating engine. Each collective rating engine is operable to perform an operation on linehaul rates calculated by rating engines on the list of rating engines maintained by the collective rating engine. Note that the list of rating engines that the collective rating engine operates on can include both base rating engines and collective rating engines. FIG. **8** illustrates an example of the use of collective rating engines.

The use of collective rating engines results in a tree-like structure where each node in the tree comprises either a base

rating engine or a collective rating engine. Each leaf node of the tree comprises a base rating engine object, while each non-leaf node of the tree will comprise a collective rating engine object. The term "leaf node" refers to a node of the tree that has a parent node, but no children nodes associated with it. Note that the resulting tree frequently is not binary, as a collective rating engine may operate on more than two rating engines.

The function of the various collective rating engines will now be described. An instance of selective rating engine object class **102** will loop through its vector of rating engines and will stop when a rating engine finds a rate. Note that the term "rate" is used broadly to mean calculating a price, a multiplier to be applied to a price, or some other numerical or boolean value for a particular service. Although the rating engine will calculate a rate for linehaul service, each of the individual base and collective rating engines making up the overall rating engine may compute intermediate results that may also be referred to as rates. Accordingly, the term "rate" may refer to a particular parameter used to calculate the overall price for a shipment of goods. A rate may not always be determinable by a particular base rating engine or collective rating engine. Instead, a rate not found message may be returned by a particular base rating engine or collective rating engine. Thus, an instance of selective rating engine object class **102** will attempt to obtain a rate by looping through its ordered vector of rating engines and will stop when one of those rating engines returns a rate rather than a rate not found message.

The ordered vector utilized by selective rating engine **102** is ordered primarily by a priority assigned to each rating engine in the list, and secondarily according to a start date value assigned to each rating engine in the list. A priority code is maintained as an instance variable by each base or collective rating engine. This priority code is used to create an ordered list of rating engines operated on by a particular collective rating engine. This type of priority could be implemented in other ways, such as merely by ordering the objects when creating instances of the rating engines or by assigning priority based upon the type of rating engine. Any of these methods could be used without departing from the scope of the invention.

Another feature of the present invention that allows fast and efficient calculation of linehaul service rates is the grouping of rating data by the dates on which that data is effective. According to this feature of the invention, a rating engine specifies a start date and an end date for which the rating data associated with that object is valid. If the ship date does not fall within the date range, then that rating engine will return a rate not found message in response to a request to calculate a rate. In this embodiment, the secondary prioritization of the list of rating engines in a collective rating engine is performed in inverse order by start date. Accordingly, rating engines with equal priority codes having start dates that are later in time have a higher priority than rating engines with start dates that are earlier in time. Grouping of rate data according to effective dates allows the data to be located quickly, and also avoids replication of data. Because there may be a large number of items of rating data that have identical start and end dates, creating a rating engine containing rates with the same start date and end date avoids the need to store a start date and end date with each item of rating data.

In this embodiment, a new rating engine having a different date range is created even if a particular table containing 1,000 different rates incurs only a few changes due to typographical errors discovered by the carrier. The invention still results in lower storage requirements and faster processing times because if rating data was not grouped by effective dates, then a more complicated representation of rates at a lower level would significantly increase the size of rate data tables. In addition, if date information is stored at a lower level, substantial additional processing is required to determine whether the date fell within the date range applicable to a particular rating data item. The invention obtains a performance benefit, both by facilitating the loading of rate tables in memory rather than storage on a disk, as well as by not having to search through a limited set of date ranges before obtaining an individual rate data item at the lane level. FIG. **8** will be used to illustrate how the start date and end date associated with a rating engine affects the operation of the overall rating engine.

An instance of additive rating engine object class **104** will loop through its vector of rating engines and will add the results calculated by those rating engines together. For example, a continuous move operation would use this rating engine to add the results from a zone zone type engine with the results of a destination fee calculated by a zone value-type engine.

An instance of multiplier rating engine object class **106** will loop through its vector of rating engines and will multiply all of the results together. Less than truckload rating engines may use this type of engine to multiply the cost of the less than truckload rate by the carrier's discount. The carrier's discount will normally be calculated using a base rating engine such as an instance of standard YF 500 discount rating engine object class **112**. The value of the discount is normally expressed as a percentage of the actual rate. Accordingly, the "rate" produced by an instance of standard YF 500 discount rating engine will not comprise an actual price, but will instead comprise a percentage value reflecting the proper discount. Accordingly, rating engines do not always calculate price parameters, but instead may calculate other parameters associated with a rating request. The term "rate" is meant to broadly encompass these parameters.

An instance of maximum rating engine object class **110** and an instance of minimum rating engine object class **108** loop through their vector of rating engines and will return the highest cost rate and the lowest cost rate, respectively, determined by each engine in their vector of rating engines.

Note that rating engine object class **96** is an abstract class. It is used to define a common interface to all base and collective rating engines.

An example of a rating engine associated with an instance of carrier contract object class **70** will be discussed in connection with FIG. **8** below. For present purposes, it is sufficient to note that the rating engine associated with a particular instance of a carrier contract object class may comprise a base rating engine, and/or a collective rating engine in combination with one or more additional base rating engines. Each of these rating engines is operable to calculate a linehaul rate in response to a rating request issued to the instance of carrier contract object class **70**. Again, the term "linehaul rate" is used broadly with rate having the broad meaning discussed above. Although the final result calculated by the rating engine will normally be the price for linehaul service, a linehaul rate calculated by a particular base rating engine or collective rating engine may only be some other type of parameter used to determine the final linehaul price.

Each base rating engine object and collective rating engine object has a method operable to calculate a linehaul

rate and a rate data structure comprising at least one rate value and accessible by the rating method for use in calculating a linehaul rate. In this embodiment, each of the individual rating engine objects are contained in an instance of carrier contract object class **70**. The modular rating engine structure may be implemented in a different way without departing from the scope and teachings of the invention. For example, rating engines could be used by, rather than contained in, a carrier contract object. In addition, rating engines could be implemented as methods of the carrier contract object class. Also, a rating engine could be implemented as an ordinary software module containing a collection of procedures and variables. The functions of the collective rating engines could be implemented as methods of a carrier contract object that have access to base rating engine objects contained in or used by the carrier contract object. It should also be noted that a carrier contract object is broadly defined to comprise a collection of data representing contract terms of a contract between a carrier and a customer. Carrier contracts could be implemented in a different format such that each carrier contract is not represented by its own carrier contract object.

Although the invention includes the base and collective rating engines described above, other base rating engines and/or collective rating engines could be used in a computerized rating system without departing from the scope of the invention. One or more of the collective rating engines and/or base rating engines could also be omitted from a computerized rating system without departing from the scope of the invention.

In addition to the charges for basic linehaul service, contracts between a carrier and a customer may include charges for a large number of additional services that may be applicable to that particular contract. These charges could be flat charges, charges billed by the mile, charges by the hour, charges by the day, or charges by some other unit. Service charges include, but are not limited to, charges for tarps, night delivery, or rigging, to name just a few. Also, for certain types of shipments, equipment may be rented on a per-mile basis by the customer. Such a service would be described by the equipment type. Table 1 lists a series of services that can be handled by an embodiment of a computerized rating system constructed in accordance with the invention. Table 1 also indicates the unit of measure associated with a particular type of service. "FLT" refers to a flat rate unit of measure. "DAY" refers to a charge by the day. "HRS" refers to charges by the hour. "MI" refers to charges by the mile. "LBS" refers to charges by the pound. "UNT" refers to charges by the unit. "WD" refers to charges by per one hundred pounds of weight.

TABLE 1

Service Description	Unit of Measure	Service Description	Unit of Measure
Second-Day Service	LBS	Advancing Charge	FLT
Advanced Equipment	FLT	Air-Ride Tractor	FLT
Auto Store Stop	FLT	Backhaul	MI
Bobtail Mileage	MI	Carrier-Owned Trailer	FLT
Canadian Bx Stop-off	UNT	Customer Equipment Return	FLT
Cheps Loads	UNT	Continuous Move Adjustment	FLT
Continuous Move Charge	FLT	Consolidation Charge	FLT
Contract Payable	FLT	C.O.D.	FLT
Canadian Prov. Tax	FLT	Crane Charge	FLT

TABLE 1-continued

Service Description	Unit of Measure	Service Description	Unit of Measure
Customer Notification	FLT	Constant Surveillance	FLT
Cartage Delivery	FLT	Customs Fee	FLT
Certified Weight Tickets	FLT	Commodity Check	FLT
Assist Load	LBS	Assist Unload	FLT
Doubles Charge	FLT	Dock Work	HRS
Dual Driver Protection Service	FLT	GM Dedicated Delivery	FLT
Decontainerize	FLT	Detention, Driver	HRS
Detention, Intransit	DAY	Detention, Rail Trailer	DAY
Detention, Trailer	DAY	Devanning	FLT
Deficit Miles	FLT	Dedicated Hourly Charge	HRS
Hand Load	FLT	Deadhead Mileage	MI
Hand Unload	FLT	Diversion	FLT
Delivery Charge	FLT	Dispatch of Equipment	MI
Driver Charge	UNT	Dropdeck Trailer	FLT
Direct Shipment	FLT	Dedicated Contract	FLT
Dunnage	FLT	Deficit Weight	FLT
Excess Refer Usage	HRS	Escort/Pilot Car	FLT
Equipment Staging Fee	FLT	Exclusive Use of Vehicle	FLT
Event	FLT	Excess Miles	MI
Expedited Service	FLT	Expandable Trailer	FLT
Excess/High Value	FLT	Foreign Carr Cartage	FLT
Flatbed Trailer	FLT	Foreign Location Point	FLT
Fuel Related Adjustment	FLT	Ferry Charge	FLT
Fuel Surcharge	MI	Full Visible Capacity	FLT
Canadian Federal Tax	FLT	Hazardous Material	FLT
Heated Blanket Charge	FLT	Handling Charge	WD
Heavy Haul Load	FLT	Hot Parts Separation	FLT
Hopper Services	FLT	Inside Delivery	FLT
Insurance Adjustment	FLT	Inbond	FLT
Intercity Service	FLT	International Paper/Special Service	FLT
Just In Time	FLT	Layover - Overnight	FLT
Layover - Weekend	FLT	Layover, Overnight and Weekend	HRS
Local Work	FLT	Load Delivery	FLT
Load Delivery	FLT	Labor Disturbance Charge	FLT
Labor for Crane	FLT	Lift Gate Service	FLT
Linehaul	MI	Lumper Service	UNT
Labor Other Than Crane	FLT	Lowboy Equipment	FLT
LTL Discount Service	UNT	Lift Truck Service	FLT
Miscellaneous Allowance	FLT	Mexican Box Stopoff	UNT
Miscellaneous Charge	FLT	Motor Surveillance	FLT
Non-Contracted Carrier	FLT	Night Delivery	FLT
Next Day Service	LBS	New York/Long Island Pickup/ Delivery	FLT
New York/Long Island Overdimension	FLT	Overdimension Charge	MI
Pre Summit GM Bills	FLT	Order Notify Bill of Lading	FLT
Out of Route	MI	Outriggers	FLT
Pier Charges	FLT	Plant Directed	FLT
Pallet Exchange	UNT	Permit Charge	FLT

TABLE 1-continued

Service Description	Unit of Measure	Service Description	Unit of Measure
Proof of Delivery	FLT	Promotional Drop	FLT
Power Repositioning	FLT	Reconsignment	FLT
Required Delivery Date	FLT	Redelivery	MI
Return Empty Charge	FLT	Rejected Shipment	FLT
Driver Relay	FLT	Removable Gooseneck	FLT
Rigging Charge	FLT	Round Robin Charge	FLT
Revenue Share	UNT	Satellite Service	FLT
Sidewalk Delivery	FLT	Shag Service	FLT
Shuttle	FLT	Sides	FLT
Simultaneous Pickup/Delivery	FLT	Sold Binders	FLT
Slipsheet Load	FLT	Sold Straps	FLT
Special Tolls	FLT	Sold Winches	FLT
Small Package	FLT	Satellite Motor Surveillance	FLT
Supplemental Increase	FLT	Stopoff, Peddle Run	MI
Spotting	FLT	Supervan Trailer	FLT
Slipsheet Allowance	FLT	Signature Security Service	NULL
Storage	DAY	Stopoff	FLT
Saturday Pickup or Delivery	FLT	Stopoff Service	FLT
Sunday/Holiday Pickup/Delivery	FLT	Sufferance Warehouse	FLT
Switching Service	FLT	Van Refrigerated Van	MI
45' Van Trailer	MI	53' Van Trailer	MI
48' Van Trailer	MI	45' Van Container	MI
40' Van Container	MI	20' Van Container	MI
48' Van Container	MI	53' Van Container	MI
48' Flat Bed	MI	48' Single Drop Flatbed	MI
Open Top trailer	MI	Concerta Van	MI
Air Ride Van	MI	Heated Van	MI
Flat Bed	MI	Flat Bed with Racks	MI
Drop Flatbed with Racks UNCR	MI	Drop Flatbed with Racks - 12	MI
Flatbed with Racks UNCR	MI	Flatbed with Racks - 12	MI
Double Drop Flatbed with Racks - 5	MI	Double Drop Flatbed with Racks - 6	MI
Road Railer	MI	Reefer Stack	MI
20' Export Container	MI	40' Export Container	MI
45' Export Container	MI	48' Export Container	MI
53' Export Container	MI	Piggy Back (TOFC)	MI
Transportation Consultant	FLT	Team Service	MI
Through Rate	MI	Trailer Interchange	FLT
Tire Repair Service	FLT	Termination Fee	FLT
Tank Trailer Expandable	FLT	Tolls, Bridge or Tunnel	UNT
Tier 2	FLT	Transaction Fee	FLT
On Train	FLT	Tractor Usage	FLT
Trailer Repositioning	FLT	Trailer Usage	FLT
Terminal Service	FLT	Tarps	UNT
Trailer Repair Service	FLT	Trailer Size	FLT
Truck/Rail Rate	FLT	Test Service	FLT
Test Service	FLT	Thru Trailer Charge	FLT
Thru Trailer Mileage	FLT	Unloading Allowance	FLT
Van Trailer	FLT	Vancouver Island Mileage	FLT
Vehicle Ordered, Not Used	FLT	Weighing Charge	FLT
Warehouse Service	FLT	Cross Dock Charge	MI
EXP REM Gooseneck	FLT	XXXX Service	FLT
Yard Work	FLT	Zee Services	FLT

Like the rating engines described above, service engines are designed to process different service rate structures which include direct, geography matrices, tiered, and complex combinations of these structures. Like the rating engines described above, service engines are modular and comprise one or more instances of object classes comprising base service engines and collective service engines. Each base and collective engine object class inherits from the abstract class service engine object class **78**. All collective service engines inherit from collective service engine object class **80** while all base service engines inherit from base service engine object class **84**.

Instances of the base service engines of direct service engine object class **90**, zone zone service engine object class **88** and band value service engine object class **86** contain the actual rate data which is made up of service codes, and index type (origin/destination type or band type) tiered type (if applicable), a unit of measure, and an effective date range. In addition to the specific base service engines, there are collective service engines such as selective service engine object class **82**. Again, the collective service engines function similarly to the collective rating engines, and contain a list of other service engines which could be base service engines as well as selective service engines, and a method for processing the rating engines in this list.

Each service engine for a carrier contract will be for a specific service code, of a specific service engine type, tiered type (if applicable) unit of measure code, effective start date, and effective end date. Service engines may be arranged in a hierarchical manner using instance variables that indicate the parent of a particular rating engine as well as a priority instance variable indicating the relative priority between service engines. Service engines may also include a date range during which the data stored in that service engine is valid. Thus, the service engines operate similarly to the rating engines.

In fact, an instance of selective service engine object class **82** operates identically to an instance of selective rating engine object class **102**, except for the type of object that it operates upon. Accordingly, as will be seen in discussing FIG. **7**, it may be somewhat redundant to have both service engine object classes and rating engine object classes. Instead, a more complete set of service engine object classes can be defined to handle all types of services, including the linehaul service handled by the rating engine object classes in this embodiment.

In this embodiment, each instance of carrier contract object class **70** may also be associated with an instance of contract services object class **76**. This object class contains a list of service engines that may be used to calculate the price for various services included in a rating request. In this embodiment, an instance of contract services object class **76** is contained in an instance of carrier contract object class **70**. However, the function of an instance of contract services object class **76** could be performed by methods and instance variables contained in the carrier contract object.

Tiered services may be implemented with quantity band rate structures, which are similar to mileage and weight band structures implemented with the rating engines. Quantity bands will not have any limitation on the ranges, and will be tied to the service unit of measure. Tiered services can be designated as independent or cumulative. Independent means that each service is rated by itself. Cumulative means that all services of a specific service code must be rated cumulatively. An example of a cumulative service rating is where stopoff services are stored individually for each stop but are rated cumulatively.

Cumulative service rating will be accomplished by passing in the service that needs rating as well as the vector of all services for the request. The service rating method must understand that the service charge is cumulative and look for other services with the same service code as the one being rated. Then it must be determined according to the order of stops where the one being rated falls. With this information, the service can be rated correctly.

As noted above with respect to the rating engines, various changes can be made in the implementation of these service engines without departing from the scope of the invention. Some of the changes and alterations include changes and alterations similar to those described in connection with the rating engines above.

FIG. **7** illustrates a class diagram of a portion of a second embodiment of a computerized rating system constructed in accordance with the invention. In this embodiment, the rating engine has been eliminated and its functions are performed by a service engine. Accordingly, a carrier contract in such an embodiment is associated only with a qualification engine and a service engine. The cost of linehaul service, as well as all other services, is calculated by the service engine. As noted above, this means that the cost of linehaul service calculated by the rating engine in the embodiment illustrated in FIG. **6** can be considered to be just a special type of service that may be calculated by the service engine in this embodiment. The service engines that calculate the cost of linehaul service may still be referred to as rating engines or may be referred to as service engines.

Several new object classes have been added to this embodiment, including LTL service engine object class **124**, standard YF 500 discount service engine object class **126**, zone value service engine object class **128**, additive service engine object class **130**, multiplier service engine object class **132**, minimum service engine object class **134**, and maximum service engine object class **136**. The function performed by instances of these object classes is identical to the function of the similarly named rating engine object class in FIG. **6**. Here, the engines are more generically referred to as service engines, as they may be used to calculate the cost of services other than linehaul services. Their operation, however, is similar to the operation of the embodiments illustrated in FIG. **6**.

This embodiment of the invention thus provides the same modular approach as the embodiment illustrated in FIG. **6**, although only a single collection of base and collective engines making up a service engine is provided.

FIG. **8** illustrates an object diagram of a portion of a carrier contract implemented in accordance with the embodiment illustrated in FIG. **6**. This carrier contract includes carrier contract object **138**, additive rating engine **140**, selective rating engine **142**, zone value rating engine **144**, zone zone rating engine **146**, zone zone rating engine **148**, and zone zone rating engine **150**.

Carrier contract object **138** comprises an instance of carrier contract object class **70**. Additive rating engine object **140** comprises an instance of additive rating engine class **104**. Selective rating engine object **142** comprises an instance of selective rating engine object class **102**. Zone value rating engine object **144** comprises an instance of zone value rating engine object class **116**. Zone zone rating engines **146**, **148**, and **150** comprise instances of zone zone rating engine object class **114**.

This example will be used to illustrate how modular rating engines can be constructed in accordance with the invention. It will also indicate the operation of a rating engine constructed in accordance with the invention and illustrate how a collective rating engine uses an ordered list of rating engines organized according to precedence and date range.

When carrier contract object **138** receives a rating request, and determines that it is qualified to process that request, it then generates a message that is passed to additive rating engine object **140** to calculate a rate. Additive rating engine **140** contains a vector comprising selective rating engine object **142**, and zone value rating engine object **144**. Additive rating engine **140** will add the results of the rates calculated by selective rating engine object **142**, and zone value rating engine **144**. Accordingly, additive rating engine **140** first generates a message to selective rating engine **142** to determine a rate and then generates a similar message to zone value rating engine **144**. After these rates have been calculated, the rates are added and returned to carrier contract object **138**.

Selective rating engine **142** also maintains an ordered list of rating engines, in this case, zone zone rating engine object **146**, zone zone rating engine object **148**, and zone zone rating engine object **150**. In this example, the first object on the ordered list comprises zone zone rating engine **146** because this object has a priority value (precedence) that is higher than any other object on the list. The second and third entries on the list are zone zone rating engine object **148** followed by zone zone rating engine **150**. Although zone zone rating engine **148** and zone zone rating engine **150** have an equal priority value (precedence) zone zone rating engine **148** has a start date value that is later in time than the start date value for zone zone rating engine **150**. Accordingly, zone zone rating engine object **148** has a higher order in the list in this embodiment.

It should be noted that zone zone rating engine object **146** is a zip 5 to zip 5 zone zone rating engine while zone zone rating engine objects **148** and **150** are zip 3 to zip 3 type zone zone rating engine objects. The higher precedence of the zip 5 to zip 5 zone zone rating engine may indicate that the carrier prefers to bill the customer based upon the five digit zip code but will bill the customer based upon three digit zip codes in certain instances.

In operation, the selective rating engine object **142**, after receiving a message to calculate a rate from additive rating engine object **140**, will first pass a message to zone zone rating engine object **146** to attempt to calculate a rate. If zone zone rating engine **146** returns a rate, then selective rating engine object **142** returns this rate in response to the message from additive rating engine object **140**. If zone zone rating engine **146** returns a rate not found message, then selective rating engine will send a message to zone zone rating engine object **148** in requesting it to calculate a rate. If it returns a rate, then that rate would be returned in response to the message from additive rating engine object **140**. Otherwise, if a rate not found message is returned, then selective rating engine object **142** will then generate a message to zone zone rating engine object **150**. Selective rating engine object **142** will then return either (1) the rate returned by zone zone rating engine **150** or (2) a rate not found message if zone zone rating engine **150** returns a rate not found message in response to the message generated by selective rating engine object **142**.

Each of the zone zone rating engine objects **146**, **148**, and **150** will make sure that the date included with the rating request falls within the date range specified by the start date and end date associated with the particular rating engine object. Notice that the date ranges may overlap. A computerized rating system constructed in accordance with the

invention may maintain rating engines that may no longer be used for new shipments because the end date associated with that rating engine is now earlier in time than the date on which the rating engine is being used. In other words, all of the rates associated with that rating engine have expired. The rating engine may still be maintained by the computerized rating system, however, for purposes of generating bills for the shipment, a check, invoice or payment for the shipment, and/or for report or auditing purposes.

Although the present invention has been described in detail, it should be understood that various changes, substitutions, and alterations can be made hereto without departing from the spirit and scope of the invention as defined by the appended claims.

What is claimed is:

1. An object-oriented rating engine operable to receive a rating request associated with a carrier contract, the rating engine comprising:

a first base rating engine object operable for use on a computer and further operable to calculate a line haul rate in response to the rating request, the first base rating engine object comprising an instance of an object class that inherits, either directly or indirectly, from a base rating engine object class, the first base rating engine object further comprising

a rating method operable to calculate the line haul rate, and

a rate data structure comprising at least one rate value, the rate data structure accessible by the rating method for use in calculating the line haul rate.

2. The object-oriented rating engine of claim 1, wherein the rating method is operable to calculate a line haul rate of a type selected from the group consisting of zip 5 value, zip 3 value, state value, country value, splc value, zip 5 to zip 5, splc to splc, splc to zip 3, splc to state, zip 3 to splc, zip 3 to zip 3, zip 3 to state, state to splc, state to zip 3, zip 3 range to zip 3 range, state to state, country to country, mileage band value, yellow 500, yellow 510, and direct charge.

3. The object-oriented rating engine of claim 1, wherein the first base rating engine object is contained in a carrier contract object, the carrier contract object comprising a collection of data representing contract terms.

4. The object-oriented rating engine of claim 1, wherein the first base rating engine object is used by a carrier contract object, the carrier contract object comprising a collection of data representing contract terms.

5. The object-oriented rating engine of claim 1, wherein the first base rating engine object further comprises a start date value and end date value collectively denoting a period of time for which the rate data structure provides valid data.

6. The object-oriented rating engine of claim 5, wherein the first base rating engine object will not calculate the line haul rate if a date parameter provided with the rating request does not fall within the date range between the start date value and end date value.

7. The object-oriented rating engine of claim 1, wherein the first base rating engine object is contained in a contract services object, the contract services object containing at least one base service engine object, the contract services object associated with a carrier contract object, the carrier contract object comprising a collection of data representing contract terms.

8. The object-oriented rating engine of claim 7, wherein the first base rating engine object further comprises a start date value and end date value collectively denoting a period of time for which the rate data structure provides valid data.

9. The object-oriented rating engine of claim 8, wherein the first base rating engine object will not calculate the line haul rate if a date parameter provided with the rating request does not fall within the date range between the start date value and end date value.

10. The object-oriented rating engine of claim 1, further comprising:

a first collective rating engine object operable for use on a computer and further operable to calculate a second line haul rate in response to the rating request, the collective rating engine object further comprising

a rating engine data structure operable to maintain an association between the collective rating engine object and the first base rating engine object and at least a second base rating engine object, and

a collective rating method operable to calculate the second line haul rate in response to the rating request by performing an operation on line haul rates calculated by the first base rating engine object and the second base rating engine object.

11. The object-oriented rating engine of claim 10, wherein the operation performed by the collective rating method comprises a function selected from the group consisting of prioritized selection of line haul rates, addition of line haul rates, multiplication of line haul rates, minimum line haul rate, and maximum line haul rate.

12. The object-oriented rating engine of claim 10, wherein the rating engine data structure is further operable to maintain an association between the collective rating engine object and a second collective rating engine object.

13. The object-oriented rating engine of claim 10, wherein the first base rating engine object and the second base rating engine object are each operable to return a rate not found message if a rate cannot be calculated by that base rating engine object in response to the rating request;

wherein the first collective rating engine object comprises a selective rating engine object;

wherein the rating engine data structure of the first collective rating engine object further comprises an ordered list of base rating engine objects and collective engine objects organized by a priority assigned to each base rating engine object and collective engine object; and

wherein the first collective rating engine is further operable to calculate the second line haul rate in response to the rating request, the second line haul rate calculated by traversing the rating engine data structure and attempting to calculate a line haul rate using a base rating engine object or collective rating engine object associated with a particular entry on the list, returning a line haul rate calculated by the first entry on the list for which a line haul rate could be calculated and returning a rate not found result if no entry on the list could calculate a line haul rate.

14. The object-oriented rating engine of claim 13, wherein each base rating engine object further comprises a start date value and end date value collectively denoting a period of time for which the rate data structure provides valid data.

15. The object-oriented rating engine of claim 14, wherein the rating engine data structure is secondarily ordered according to the start date value.

16. An object-oriented rating system, comprising:

at least one carrier contract object, the carrier contract object operable to receive a rating request and operable for use on a computer;

a first base rating engine object operable for use on a computer and further operable to calculate a line haul

rate in response to the rating request, the first base rating engine object comprising an instance of an object class that inherits, either directly or indirectly, from a base rating engine object class, the first base rating engine object further comprising

a rating method operable to calculate the line haul rate, and

a rate data structure comprising at least one rate value, the rate data structure accessible by the rating method for use in calculating the line haul rate.

17. The object-oriented rating system of claim 16, wherein the first base rating engine object is contained in the at least one carrier contract object, the at least one carrier contract object comprising a collection of data representing contract terms.

18. The object-oriented rating system of claim 16, wherein the first base rating engine object is contained in a contract services object, the contract services object operable to receive messages from the at least one carrier contract object.

19. The object-oriented rating system of claim 16, further comprising:

a second base rating engine object;

a first collective rating engine object operable for use on a computer and further operable to calculate a second line haul rate in response to the rating request by performing an operation on line haul rates calculated by the first base rating engine object and a second base rating engine object.

20. The object-oriented rating system of claim 16, further comprising:

a plurality of additional base rating engine objects;

at least one collective rating engine object;

wherein the first base rating engine object, the additional base rating engine objects, and the at least one collective rating engine object are associated with one another in a tree-like structure such that each base rating engine object comprises a leaf node of the tree-like structure and each collective rating engine object comprises a non-leaf node of the tree-like structure.

21. The object-oriented rating system of claim 16, further comprising:

at least one collective rating engine object operable for use on a computer, each collective rating engine object further comprising

a rating engine data structure operable to maintain an association between the collective rating engine object and a plurality of operand rating engine objects wherein the operand rating engine objects comprise either collective rating engine objects or base rating engine objects, and wherein the first base rating engine object comprises one of the operand rating engine objects and

a collective rating method operable to calculate a second line haul rate in response to the rating request by performing an operation on line haul rates calculated by at least one of the operand rating engine objects.

22. The object-oriented rating system of claim 21, wherein the rating engine data structure comprises an ordered list of the operand rating engine objects ordered according to a priority assigned to each of the operand rating engine objects.

23. The object-oriented rating system of claim 21, wherein each operand rating engine object further comprises a start date value and end date value collectively denoting a period of time for which the operand rating engine object provides valid data; and

wherein the rating engine data structure comprises an ordered list of the operand rating engine objects ordered according to the start date value of each of the operand rating engine objects.

24. The object-oriented rating system of claim 23, wherein the ordered list is ordered from a latest start date value to an earliest start date value.

25. The object-oriented rating system of claim 22, wherein each operand rating engine object further comprises a start date value and end date value collectively denoting a period of time for which the operand rating engine object provides valid data; and

wherein the rating engine data structure comprises an ordered list of the operand rating engine objects ordered primarily according to a priority assigned to each of the operand rating engine objects and secondarily according to the start date value of each of the operand rating engine objects.

26. The object-oriented rating system of claim 21,

wherein the rating request comprises a date parameter; and

wherein the operand rating engine objects and the at least one collective rating engine object further comprise a start date value and end date value collectively denoting a period of time in which the date parameter must be included for the operand rating engine objects and the at least one collective rating engine object to compute a valid line haul rate in response to the rating request.

27. The object-oriented rating system of claim 16,

wherein the first base rating engine object further comprises a start date value and end date value, collectively denoting a range of ship dates for which each rate value in the rate data structure is valid.

28. A method for processing rating requests in a computer rating system, comprising:

receiving a first rating request with a base rating engine object, the base rating engine object operable for use on a computer and comprising an instance of an object class that inherits, either directly or indirectly, from a base rating engine object class, the first rating request associated with a carrier contract and comprising source data and destination data, wherein the base rating engine object comprises a rating method operable to calculate a line haul rate, and a rate data structure comprising at least one rate value, the rate data structure accessible by the rating method for use in calculating the line haul rate;

calculating a first line haul rate using the rating method in response to the first rating request.

29. The method of claim 28, wherein the base rating engine object further comprises a start date value and end date value collectively denoting a range of ship dates for which each rate value in the rate data structure is valid.

30. The method of claim 29, wherein the step of calculating the first line haul rate further comprises:

calculating the first line haul rate using the rating method in response to the first rating request if a date parameter provided with the first rating request falls within the date range between the start date value and end date value.

31. The method of claim 28, wherein the base rating engine object further comprises a start date value and end

date value collectively denoting a range of ship dates for which the base rating engine object is capable of calculating the first line haul rate.

32. The method of claim **31**, wherein the base rating engine object is contained in a contract services object, the contract services object containing at least one base service engine object, the contract services object associated with a carrier contract object, the carrier contract object comprising a collection of data representing contract terms.

33. The method of claim **28**, further comprising:

receiving a second rating request with a first collective rating engine object operable for use on a computer, each collective rating engine object further comprising

a rating engine data structure operable to maintain an association between the collective rating engine object and a plurality of operand rating engine objects wherein the operand rating engine objects comprise either collective rating engine objects or base rating engine objects, and wherein the base rating engine object comprises one of the operand rating engine objects, and

a collective rating method operable to calculate a second line haul rate in response to the second rating request by performing an operation on line haul rates calculated by at least one of the operand rating engine objects, wherein the collective rating method is further operable to generate the first rating request.

34. The method of claim **33**, wherein the rating engine data structure comprises an ordered list of the operand rating engine objects ordered according to a priority assigned to each of the operand rating engine objects.

35. The method of claim **33**, wherein each operand rating engine object further comprises a start date value and end date value collectively denoting a period of time for which the operand rating engine object provides valid data; and

wherein the rating engine data structure comprises an ordered list of the operand rating engine objects ordered according to the start date value of each of the operand rating engine objects.

36. The method of claim **33**, wherein each operand rating engine object further comprises a start date value and end date value collectively denoting a period of time for which the operand rating engine object provides valid data; and

wherein the rating engine data structure comprises an ordered list of the operand rating engine objects ordered primarily according to a priority assigned to each of the operand rating engine objects and secondarily according to the start date value of each of the operand rating engine objects.

37. A method of organizing rate data in an object oriented rating system, comprising:

associating at least one base rating engine object with a carrier contract object, the at least one base rating engine object comprising a start date value and an end date value, the base rating engine object comprising an instance of an object class that inherits, either directly or indirectly, from a base rating engine object class;

creating a rate data structure within the at least one base rating engine object, the rate data structure comprising at least one rate data value, wherein each rate data value in the rate data structure is valid data for calculating a line haul rate for a shipment occurring between the start date value and end date value.

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